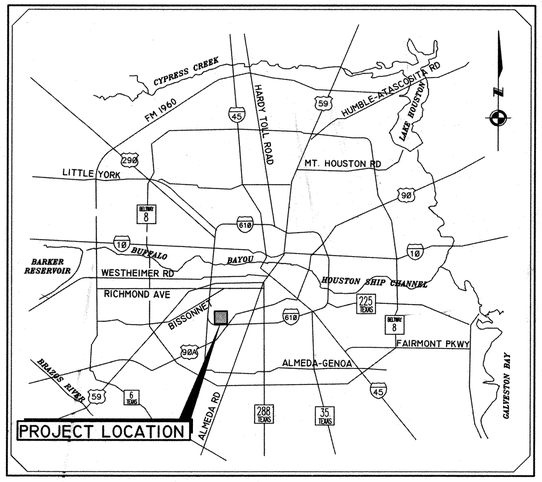
CITY OF HOUSTON

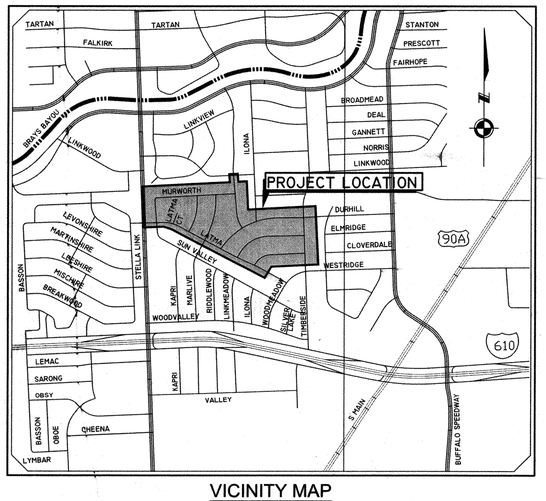
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
ENGINEERING AND CONSTRUCTION DIVISION

NEIGHBORHOOD STREET RECONSTRUCTION PROJECT NSR 446A

WOODSIDE SUBDIVISION SECTIONS 1 & 2
WBS NO. N-000378-0002-4



LOCATION MAP
Not to Scale



VICINITY MAP
Not to Scale

KEY MAP NO. 532N and 532P
GIMS MAP NO. 5254C & 5254D

TDLR EABPRJ02802687

APPROVED
FLOODPLAIN GROUP
Date: 12/7/2011 By: TDT

MAYOR
ANNISE D. PARKER

CONTROLLER

DISTRICT COUNCIL MEMBERS

HELENA BROWN, DISTRICT A	JERRY DAVIS, DISTRICT B	ELLEN COHEN, DISTRICT C
⚠ WANDA ADAMS, DISTRICT D	MIKE SULLIVAN, DISTRICT E	AL HOANG, DISTRICT F
OLIVER PENNINGTON, DISTRICT G	EDWARD GONZALEZ, DISTRICT H	JAMES G. RODRIGUEZ, DISTRICT I

MICHAEL LASTER, DISTRICT J — LARRY GREEN, DISTRICT K

COUNCIL MEMBERS AT-LARGE

STEPHEN C. COSTELLO, POSITION 1	ANDREW C. BURKS, JR., POSITION 2
MELISSA NORIEGA, POSITION 3	⚠ C.O. "BRAD" BRADFORD, POSITION 4
JACK CHRISTIE, POSITION 5	

NOTICE:
CONTRACTOR TO NOTIFY CITY OF HOUSTON
48 HOURS BEFORE STARTING CONSTRUCTION.

STATE OF TEXAS
HARRY BRIAN WALKER
53225
REGISTERED PROFESSIONAL ENGINEER
10/25/11 ⚠

HDR | CLAUNCH & MILLER
Engineering Consultants
HDR Engineering Inc. Texas Reg. No. F-754
4635 Southwest Freeway, Suite 1000 • Houston, Texas 77027
(713) 622-9264 • Fax (713) 622-9265 • www.hdrinc.com

SURVEYED BY: Landtech Consultants, Inc.
FB NO. PB#5543

STATE OF TEXAS
JOHN D. RUDLOFF
83386
LICENSED PROFESSIONAL ENGINEER
10/19/11

WATER — 11-7-11

WASTEWATER — [signature] 1/11/2012

STORMWATER

STREET & BRIDGE — NA

CONSTRUCTION — 1/20/12 (C. Jonne Surrey 11-8-11)

TRAFFIC AND TRANSPORTATION — PE 11/2/12

SIGNALS — NA

MANAGING ENGINEER — 11-7-11

PARK-FORESTRY DEPT — 11-15-11

SPONSOR DIV / DEPT — NA

CITY ENGINEER — DATE 1-26-12

DIRECTOR OF PUBLIC WORKS AND ENGINEERING — DATE 2/16/12

PUBLIC WORKS AND ENGINEERING
RECEIVED AND FILED
48978
CITY SECRETARY
HOUSTON, TEXAS

SHEET NO 1 OF 122 SHEETS

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49.	DURHILL ST. PLAN & PROFILE	STA. 4+50 TO STA. 7+50
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OMITTED

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STATE OF TEXAS
JOHN D. RUDLOFF
83386
LICENSED
PROFESSIONAL ENGINEER
10/19/11

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 | Dwn By: F. Redburn
Date: May 2011 | Chkd By: D. Jorgensen

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Drawing List

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	PUBLIC WORKS AND ENGINEERING ACCEPTED AND FILED 48978
DRAWING SCALE	
VERT: NA HORZ: NA	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	

MB

SHEET No: 2 OF 122

GENERAL CONSTRUCTION, COORDINATION & REFERENCE NOTES

1. Contractor Shall Field Verify Existing Conditions.
2. Existing Underground Utilities Are Not Guarantied To Be Shown In Their Entirety Or In Exact Locations. Contractor Shall Coordinate All Conflicts With Appropriate Agency.
3. Contractor Shall Provide A Trench Safety System To Meet, Requirements Of OSHA Safety And Health Regulation, Part 1926 And As Specified In City Of Houston #67-1457 As A Minimum.
4. Construct New Sidewalks Around Fire Hydrants, Manholes, Meter And Valve Boxes, Etc. When Possible. Where Necessary, Construct Sidewalk To Match Top Of Manholes, Valve And Meter Boxes, Etc. Where Manholes, Valve And Meter Boxes, Etc. Do Not Meet ADA Compliance, Adjust As Required To Match Proposed Sidewalk.
5. Sidewalk Areas That May Need To Be Shifted Back Of Curb To Avoid Tree Roots Are:

   Latma

   North Side - 5+05 to 5+18

   Murworth

   South Side - 11+60 to 12+30, 12+75 to 13+20

   North Side - 16+95 to 17+50

   Timberside

   South Side - 15+85 to 16+20

   North Side - 16+60 to 17+30

   Durhill

   South Side - 16+40 to 17+90

GENERAL NOTES - INSIDE CITY LIMITS

1. Proposed Inlet Baseline Offset Locations Are To Back Of Curb.
2. Proposed Pavement Baseline Offsets Are To Face Of Curb.
3. Water Line Removal Shall Include Additional Plugs As May Be Required And Disposal Of Asbestos Cement Pipe As Required In Specifications. Removal, Disposal And Plugging Shall Be Paid For Per The Unit Price Bid For Each Size Of Water Line Removal.
4. Retaining Walls Shall Be Constructed Per COH Standards Along Curbs Or Rights-Of-Way As Deemed Necessary By The COH And Shall Be Paid For Per The Extra Unit Price Bid For Retaining Walls.
5. Contractor Shall Coordinate With The City Construction Project Manager And Provide Adequate Notice As To The Need For Shutting Down The Lift Station As Required For Connection Of Force Main Adjustment To Be Made At Silver Springs And Murworth. Contact Resendo Morales with Wastewater Operations at 832-395-3504.
6. All Areas Within The Right-of-Way Disturbed By Construction Shall Be Covered With Block Sod Per Specifications And Paid For Per The Unit Price Bid.

VEGETATION PROTECTION AND REMOVAL NOTES

1. Contractor Shall Protect All Trees Along The Right-of-way Line And The Adjacent 5 Feet Outside The Right-of-way (no Separate Pay).
2. Contractor Shall Return The Construction Site To The Original Or Better Condition (no Separate Pay).
3. Yard Sprinkler Systems In Conflict With Proposed Construction Shall Be Cut And Plugged Such That Residents Can Use Remaining System. Portion of System Removed For Construction Shall Be Replaced In Original Location As Is Possible (No Separate Pay). Contractor Shall Be Aware That Due To New Wider Sidewalk Standard, Substantial Amounts Of Sprinkler Piping May Require Removal And Replacement And That He Should Figure Costs Associated With This Removal/Replacment In As An Incidental Cost To The Project.

EXISTING UNDERGROUND UTILITIES

1. Above Ground Features And Underground Utility Information Have Been Obtained From Survey, On The Ground Observation And Available Record Drawings, However, The Accuracy Of Or Completeness Of Such Information Is Not Guaranteed. The Contractor Shall Be Responsible For Locating All Existing Utilities And Shall Field Verify The Location And Elevation Sufficiently In Advance Prior To Construction.

PIPELINE COMPANY NOTES

1. Contractor Shall Verify Locations Of All Underground Pipelines Prior To Construction.
2. It Is The Contractor's Responsibility To Determine The Depth, Location And Existence Of All Existing Pipelines Which May Conflict With The Proposed Construction. This Determination Shall Be Performed In Concert With The Appropriate Pipeline Company In A Manner That Meets Their Approval.
3. The Contractor Shall Notify Pipeline Companies Prior To Excavation And/or Tunneling Operation Crossing Over Or Under The Pipeline Company's Lines. Maintenance Of A Minimum Clearance Between The Proposed Sanitary Sewer And The Existing Pipeline Shall Meet The Pipeline Company Requirements And Approval.
4. The Contractor Shall Be Aware That The Pipeline Companies May Require Locating (by Excavation Or By Use Of Other Equipment) Their Line Prior To Construction By Excavation Or By Use Of Non Destructive Equipment (Vacuum Locating Devices Or Other Equipment) For Monitoring During The Construction Operations. The Methodology Utilized For Locating The Pipeline Shall Be Approved By The Pertinent Pipeline Company Prior To Performance Of Work. The Contractor Shall Coordinate With The Pertinent Pipeline Company And Utilize Suitable Methods And Equipment Approved By The Company To Coordinate With The Pertinent Pipeline Perform The Work At No Additional Cost To The Project.
5. Contractor Shall Be Aware That Protection Of Pipelines On This Project May Require Special Bracing, Supporting And Protection Efforts. Such Efforts May Include Special Support Systems Or Structures To Meet Pipeline Company's Satisfaction. Contractor Shall Fully Coordinate Such Supports And Protection Efforts With Pipeline Company Prior To Construction. Such Special Bracing, Supporting And Protection Efforts Shall Be To The Satisfaction Of The Pipeline Company, At No Additional Cost To The Project.

TRAFFIC NOTES

1. Contractor Shall Provide And Install Traffic Control Devices In Conformance With Part Vi Of The Texas Manual On Uniform Traffic Control Devices (Texas Match, Most Recent Edition With Revisions) During Construction..
2. Contractor Shall Obtain Lane Closure Permits When Lane Closure Are Required. Requests Must Be Made At Least Three Days Prior To The Date Of Which Closure Is Sought. Call 713-837-7262 For An Application.
3. Contractor Shall Cover Excavations With Adequately Anchored Steel Plates During Non-working Hours And Open Lane For Traffic Flow.
4. If Contractor Chooses To Use A Different Method Of Traffic Control During Construction Than What Is Outlined In The Traffic Control Plan Or If (s)he Desires To Block A Lane For Which No Traffic Control Plan Was Submitted, (s)he Shall Be Responsible To Submit An Alterhate Set Of Traffic Control Plans On Reproducible Mylars Sealed And Signed By A Professional Engineer Licensed By The State Of Texas, With The Approved Set Of Drawing To Plans Review Section For Approval 10 Working Days Prior To Implementation.
5. Approved Copies Of "Traffic Control Plans" And Lane Closure Permits Shall Be Available For Inspection At Job Site At All Times.

PRIVATE UTILITY COMPANIES

CAUTION: UNDERGROUND ELECTRICAL CABLE

1. Contractor Shall Use The Utmost Caution When Performing Construction Activities In The Project Area. Should Any Underground Electrical Cable Be Exposed During The Course Of This Project, Contractor Shall Call CenterPoint Energy Customer Service Department At (713) 228-7800.

FLOOD PLAIN NOTE

1. This Project Site Is Located Partially Within Zone "AE" (Base Flood Elevations Determined) And Partially Within Zone "x" (Area Outside This 500 Year Flood Plain) On Harris County Flood Insurance Rate Map No. 48201C0865L And 48201C0870L Revised June 18, 2007. Base Flood Elevation 49.7 Occurs Throughout The Northern & Western Portion Of The Project Area.

   Contractor Is To Haul Cut Off Site And Out Of The Flood Plain. Call COH FMO @ 713-535-7823 For Disposal Or Flood Plain Info. This Applies To Utility And Surface Excavation. See Sheet 68.

Comcast

Comcast construction contact:
Bill Leopard @ 713-341-8681

CenterPoint Energy Gas

1. Notify CenterPoint Energy At (713) 675-7450 After Uncovering Any Abandoned Gas Lines. Do Not Disturb Gas Lines Until Centerpoint Energy Has Verified Status Of Line.
2. CAUTION: UNDERGROUND GAS FACILITIES:
   Locations Of CenterPoint Energy Main Lines (To Include CenterPoint Energy, Intrastate Pipeline, LLC. Where Applicable) Are Show In An Approximate Location Only. Service Lines Are Usually Not Shown. Our Signatures On These Plans Only Indicates That Our Facilities Are Shown In Approximate Location. It Does Not Imply That A Conflict Analysis Has Been Made. The Contractor Shall Contact The Utility Coordinating Committee At (713) 223-4567 Or 1-800-669-8344 A Minimum Of 48 Hours Prior To Construction To Have Main And Service Lines Field Located.

   A. When CenterPoint Energy Pipe Line Marking Are Not Visible, Call (713) 967-8037 (7:00 A.M. To 4:30 P.M.) For Status Of Line Location Request Before Excavation Begins.

   B. When Excavating Within Eighteen Inches (18") Of Indicated Location Of CenterPoint Energy Facilities, All Excavation Must Be Accomplished Using Non-Mechanized Excavation Procedures.

   C. When CenterPoint Energy Facilities Are Exposed, Sufficient Support Must Be Provided To Facilities To Prevent Excessive Stress On The Piping.
3. The Contractor Is Fully Responsible For Any Damages Caused By His Failure To Exactly Locate And Preserve These Underground Facilities.

CenterPoint Energy Power

WARNING: OVERHEAD ELECTRICAL FACILILTIES
Overhead Lines May Exist On The Property. We Have Not Attempted To Mark Those Lines Since They Are Clearly Visible, But The Contractor Should Locate Them Prior To Beginning Any Construction. Texas Law, Section 752, Health & Safety Code, Forbids All Activities In Which Persons Or Things May Come Within Six (6) Feet Of Live Overhead High Voltage Lines. Parties Responsible For The Work, Including Contractors, Are Legally Responsible For The Safety Of Construction Workers Under This Law. This Law Carries Both Criminal And Civil Liability. To Arrange For Lines To Be Turned Off Or Removed Call CenterPoint Energy At 713-207-2222.

AT&T TEXAS / SWBT

The Locations Of AT&T Texas/SWBT Facilities Are Shown In An Approximate Way Only. The Contractor Shall Determine The Exact Location Before Commencing Work. He Agrees To Be Fully Responsible For Any And All Damages Which Might Be Occasioned By This Failure To Exactly Locate And Preserve These Underground Utilities.

The Contractor Shall Call 1-800-344-8377 A Minimum Of 48 Hours Prior To Construction To Have Underground Lines Field Located.

When Excavating Within Eighteen Inches (18") Of The Indicated Location Of AT&T Texas/SWBT Facilities, All Excavations Must Be Accomplished Using Non-Mechanized Excavation Procedures. When Boring The Contractor Shall Expose The AT&T Texas/SWBT Facilities.

When AT&T Texas/SWBT Facilities Are Exposed, The Contractor Will Provide Support To Prevent Damage To The Conduit Ducts Or Cables. When Excavating Near Telephone Poles The Contractor Shall Brace The Pole For Support.

The Presence Or Absence Of AT&T Texas/SWBT Underground Conduit Facilities Or Buried Cable Facilities Shown On These Plans Does Not Mean That There Are No Direct Buried Cables Or Other Cables In Conduit In The Area.

Please Contact The AT&T Texas Damage Prevention Manager Mr. Roosevelt Lee Jr. At (713) 567-4552 Or E-mail Him At rl7259@att.com, If There Are Questions About Boring Or Excavation Near Our AT&T Texas/SWBT Facilities.

AB

MK.	DESCRIPTION	DATE	DWN.	CHK.
1	REVISED NOTES	12/2	DF	AW

REVISIONS

PRIVATE UTILITY LINES SHOWN
AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.

Centerpoint Energy Power Facilities — Date: 11/3/11
(Approved only for crossing underground ductlines, unless otherwise noted.)
Valid At Time Of Review Only

Approved for AT&T Texas/SWBT underground conduit facilities only. — Date: 11-1-11
Signature valid for one year.

Centerpoint Energy Gas Facilities — Date: 11/3/11
(Centerpoint service lines are not shown.)

Cable Company — Date:

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Fax (713) 622-9265

STATE OF TEXAS — JOHN D. RUDLOFF — 83386 — LICENSED PROFESSIONAL ENGINEER — 10/19/11

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 | Dwn By: F. Redburn
Date: May 2011 | Chkd By: D. Jorgensen

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

GENERAL NOTES

WBS NO.
N-000378-0002-4
DRAWING SCALE
VERT: NA HORZ: NA
CITY OF HOUSTON PM
MARK BOARD, P.E.
SHEET No: 3 OF 122

FOR CITY OF HOUSTON USE ONLY

PUBLIC WORKS AND ENGINEERING — REVIEWED AND FILED — 48978 — REGISTERED ENGINEER — STATE OF TEXAS

KEYED NOTES

1. REMOVE AND DISPOSE OF SEWERS AND SEWER LEADS (18" OR LESS).
2. REMOVE EXIST. INLET (ALL TYPES)
3. REMOVE EXIST. STM. SWR. MANHOLES
4. REMOVE EXIST. STM. SWR. PIPE ≥ 21"
5. REINSTALL LOOP DETECTOR SAWCUT, WITH LOOP WIRE, PER COH STANDARD DETAIL Ø2893-11. CONNECT NEW LOOP WIRE TO EXISTING ADJACENT GROUND BOX AT NO SEPARATE PAY.
6. REMOVE AND REPLACE SPRINKLER HEAD. SPRINKLER LINES TO BE PLUGGED SO REST OF SYSTEM CAN BE USED (N.S.P.I.)
7. PLUG EXIST. STM. SWR.
8. ABANDON AND FILL EXIST. STM. SWR. MANHOLES PER DETAIL IN PLANS
9. ABANDON AND GROUT FILL EXIST. STM. SWR. PIPES
10. ABANDON EXIST. FORCE MAIN PIPE PER SPECIFICATIONS
11. ABANDON EXIST. WATER VALVE PER SPECIFICATIONS
12. ADJUST EXIST. MANHOLE RING AND COVER
13. ADJUST EXIST. VALVE BOX
14. EXIST. ELECTRICAL BOXES TO BE REMOVED & REPLACED, SEE LIGHTING PLANS.
15. MAKE MINOR ADJUSTMENT TO SIDEWALK LOCATION TO AVOID CONFLICTS WITH EXISTING OR PROPOSED FIRE HYDRANTS, METER BOXES, VALVE BOXES AND CLEANOUTS, ETC. WHERE NECESSARY ADJUST MANHOLE TOPS, METER BOXES, VALVE BOXES AND CLEANOUTS, ETC. TO NATURAL GROUND, TOP OF PAVEMENT, DRIVEWAYS AND/OR SIDEWALKS PER COH DESIGN STANDARDS. WHERE ITEMS ARE LOCATED IN SIDEWALKS, MEET ADA REQUIREMENTS. (N.S.P.I.)
16. NOT USED
17. LONG SIDE WATER SERVICE REPLACEMENT WITH METER BOX
18. SHORT SIDE WATER SERVICE REPLACEMENT WITH METER BOX
19. PROPOSED YARD DRAIN WITH OR WITHOUT YARD GRATE (SEET DETAIL SHEET 11Ø)
20. 5 FOOT TRANSITION TO EXIST. SIDEWALK (PLACE PREFORMED JOINT AT CONNECTION TO EXISTING SIDEWALK)
21. MATCH EXIST. WALKWAY (PLACE PREFORMED JOINT AT CONNECTION TO EXISTING WALKWAY OR BACK OF CURB)
22. PROPOSED STANDARD 6" CONCRETE CURB (PAINT YELLOW AT MEDIAN NOSES)
23. PROPOSED CONCRETE MEDIAN (PAINT BLACK)
24. PROPOSED CONCRETE WHEEL CHAIR RAMP
25. PROPOSED 5' CONCRETE SIDEWALK (typ.)
26. PROPOSED 7" CONCRETE PAVING ON 8" MIN. LIME STABILIZED BASE W/ 6" CURB
27. CONTRACTOR SHALL COORDINATE SUPPORT, ADJUSTMENT OR RELOCATION OF POWER/LIGHT POLES AND/OR GUY ANCHORS W/ OWNER OF POLES, AS REQUIRED.
28. PROP. PAVEMENT TO BE TIED TO EXIST. PAVEMENT WITH DOWELS PER CONCRETE TRANSITION DETAIL AND/OR COH STANDARD DETAIL Ø2902-Ø1

E15 PROP. DRIVEWAY INFORMATION (SEE TABLE SHEET 121)

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HDR Engineering Inc. Texas Reg. No. F-754

JOHN D. RUDLOFF
4635 Southwest Freeway
Suite 1000
Houston, Texas 77027
(713) 622-9264
Fax (713) 622-9265

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

STATE OF TEXAS · JOHN D. RUDLOFF · 83388 · LICENSED PROFESSIONAL ENGINEER · 10/19/11

Job No.: 09-051	Dwn By: F. Redburn
Date: May 2011	Chkd By: D. Jorgensen

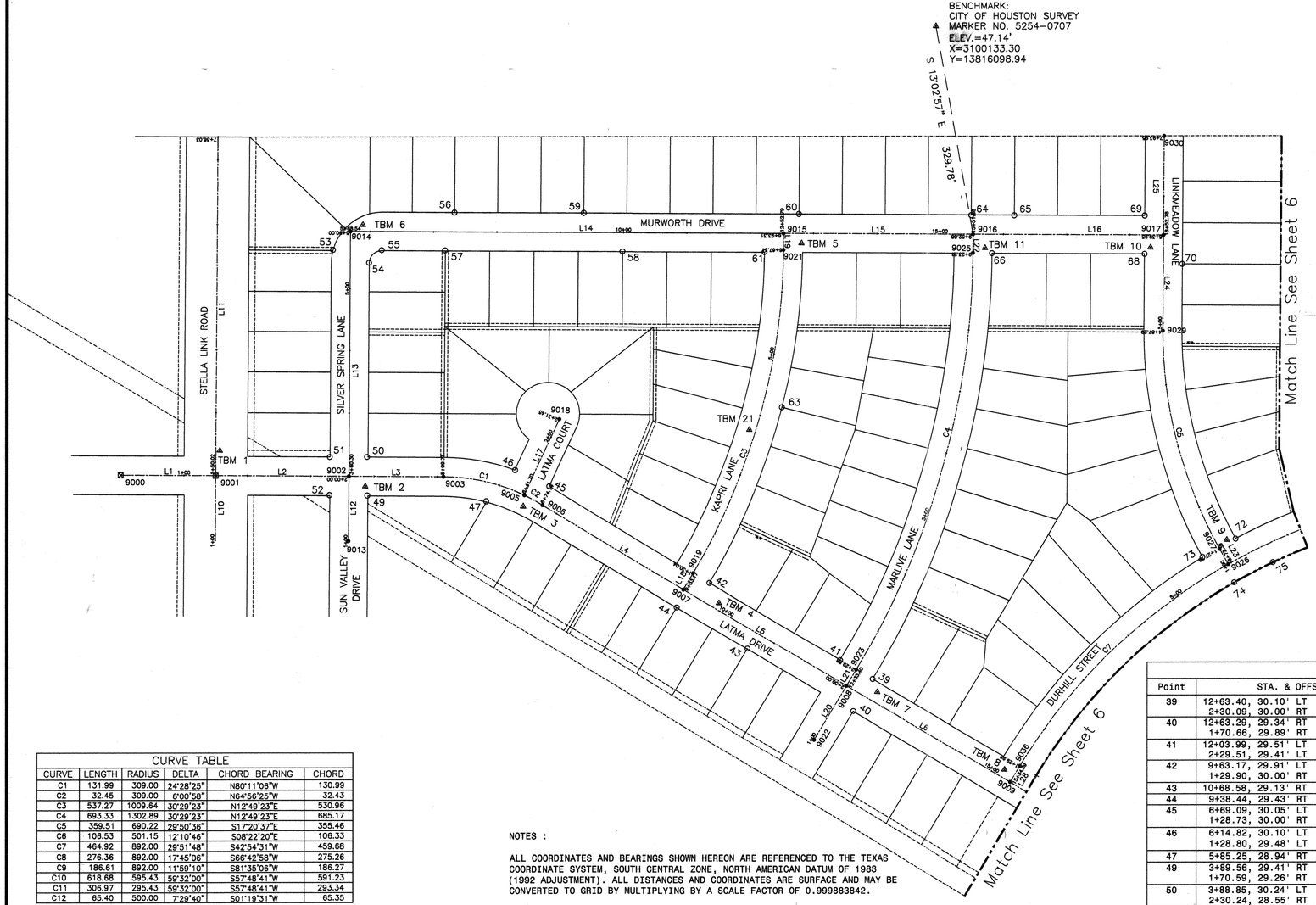
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Key Notes

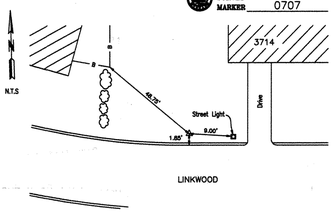
WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	
DRAWING SCALE	
VERT: NA HORZ: NA	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	
SHEET No: 4 OF 122	

PUBLIC WORKS AND ENGINEERING · APPROVED · 48978 · NUMBER



CITY OF HOUSTON

CITY SURVEY MARKER 5254 0707



ON MAP SHEET: 5255-D3

Texas Coordinate System of 1983, S.C. Zone NAD 83
X= 3099773.198
Y= 13814494.093

Elevations Adjustment
47.14 NAVD 88 (GEOID03)
Method For Vert. CONVENTIONAL
Ellpsoid Height= N\A

Lat.= 29°41'12.4258"N
Lon.= 95°26'11.2746"W
Method For Horizontal GPS\OBS

General Location: IN YARD OF 3714 LINKWOOD BEHIND CURB
Date Set: August, 1968 Type of Mark: 4A
Survey Markers Useful As Azimuth From Station
(Notes: Set approx. 1" below ground; not numbered when set)

NOTE:
1. Azimuths are from South orientation.
2. Scale Factor (S.F. 0.999883842).
3. Surface= Grid / S.F.

Surveyed By. LANDTECH CONSULTANTS
2525 N. LOOP W. STE 300
Houston, TX 77008

REVISED: 06-22-2010

City of Houston, Harris County, Texas

LINE TABLE		
LINE	LENGTH	BEARING
L1	150.02	N87°34'41"E
L2	210.28	N87°34'41"E
L3	149.41	N87°34'41"E
L4	259.03	S61°55'56"E
L5	300.23	S61°55'56"E
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L13	390.00	N02°25'19"W
L14	684.25	N87°34'41"E
L15	299.19	N87°34'41"E
L16	300.80	N87°34'41"E
L17	131.45	N22°05'20"E
L18	30.04	N28°04'04"E
L19	26.00	N02°25'19"W
L20	100.00	N28°04'04"E
L21	29.88	N28°04'04"E
L22	29.67	N02°25'19"W
L23	27.78	N32°15'54"W
L24	152.66	N02°25'19"W
L25	154.00	N02°25'19"W
L26	85.85	N14°27'43"W
L27	53.07	N02°16'57"W
L28	29.95	N28°04'04"E
L29	565.22	N87°34'41"E
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L34	563.41	N87°34'41"E
L35	83.41	N02°25'19"W
L36	305.54	N02°25'19"W
L37	298.60	N02°25'19"W
L38	299.98	N02°25'19"W
L39	153.72	N02°25'19"W

CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	CHORD BEARING	CHORD
C1	131.99	309.00	24°28'25"	N80°11'06"W	130.99
C2	32.45	309.00	6°00'58"	N64°56'25"W	32.43
C3	537.27	1009.64	30°29'23"	N12°49'23"E	530.96
C4	693.33	1302.89	30°29'23"	N12°49'23"E	685.17
C5	359.51	690.22	29°50'36"	S17°20'37"E	355.46
C6	106.53	501.15	12°10'46"	S08°22'20"E	106.33
C7	464.92	892.00	29°51'48"	S42°54'31"W	459.68
C8	276.36	892.00	17°45'06"	S66°42'58"W	275.26
C9	186.61	892.00	11°59'10"	S81°35'06"W	186.27
C10	618.68	595.43	59°32'00"	S57°48'41"W	591.23
C11	306.97	295.43	59°32'00"	S57°48'41"W	293.34
C12	65.40	500.00	7°29'40"	S01°19'31"W	65.35

DESIGN BASELINE POINT TABLE			
Point	Northing	Easting	Description
9000	13815331.2457	3098881.7041	SET NAIL w/SHINER (LATMA BL BEGIN)
9001	13815337.5851	3099031.5901	CUT X IN CONC. (INT. LATMA/STELLA LINK)
9002	13815346.4708	3099241.6823	SET NAIL w/SHINER (INT. LATMA/SILVER SPRING)
9003	13815352.7843	3099390.9575	SET NAIL w/SHINER (LATMA BL PC)
9005	13815330.4557	3099520.0263	SET NAIL w/SHINER (INT. LATMA DR/LATMA CT)
9006	13815316.7193	3099549.4041	SET NAIL w/SHINER (LATMA BL PT)
9007	13815194.8415	3099777.9704	SET NAIL w/SHINER (INT. LATMA/KAPRI)
9008	13815053.5789	3100042.8902	SET NAIL w/SHINER (INT. LATMA/MARLIVE)
9009	13814911.9603	3100308.4775	SET NAIL w/SHINER (INT. LATMA/DURHILL)
9013	13815246.5601	3099245.9079	CUT X IN CONC. (SUN VALLEY BL BEGIN)
9014	13815736.1225	3099225.2022	CUT X IN CONC. (INT. SILVER SPRING/MURWORTH)
9015	13815765.0368	3099908.8459	SET COTTON SPINDLE (INT. MURWORTH/KAPRI)
9016	13815777.6794	3100207.7640	SET COTTON SPINDLE (INT. MURWORTH/MARLIVE)
9017	13815790.3900	3100508.2918	SET NAIL w/SHINER (INT. MURWORTH/LINKMEADOW)
9018	13815452.2606	3099569.4588	SET NAIL w/SHINER (LATMA CT BL END)
9019	13815221.3475	3099792.1041	SET NAIL w/SHINER (KAPRI BL PC)
9021	13815739.0630	3099909.9444	SET COTTON SPINDLE (KAPRI BL PT)
9022	13814965.3397	3099995.8386	UNABLE TO SET (MARLIVE BL BEGIN)
9023	13815079.9479	3100056.9508	SET NAIL w/SHINER (MARLIVE BL PC)
9025	13815748.0339	3100209.0179	SET NAIL w/SHINER (MARLIVE BL PT)
9026	13815275.0763	3100635.5337	SET NAIL w/SHINER (INT. DURHILL/LINKMEADOW)
9027	13815298.5642	3100620.7052	SET NAIL w/SHINER (LINKMEADOW BL PC)
9029	13815637.8632	3100514.7428	SET COTTON SPINDLE (LINKMEADOW BL PT)
9030	13815944.2539	3100501.7842	SET NAIL w/SHINER (LINKMEADOW BL END)
9036	13814938.3901	3100322.5706	SET NAIL w/SHINER (DURHILL BL PC)

NOTES :

ALL COORDINATES AND BEARINGS SHOWN HEREON ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM, SOUTH CENTRAL ZONE, NORTH AMERICAN DATUM OF 1983 (1992 ADJUSTMENT). ALL DISTANCES AND COORDINATES ARE SURFACE AND MAY BE CONVERTED TO GRID BY MULTIPLYING BY A SCALE FACTOR OF 0.999883842.

BENCHMARK:
CITY OF HOUSTON SURVEY MARKER NO. 5254-0707 IN YARD OF 3714 LINKWOOD BEHIND CURB, ELEV.= 47.14' CORS (GEOID03)
TSARP RM. 040140 ALUMINUM ROD LOCATED AT SOUTH SIDE OF BRAYS BAYOU, APPROXIMATELY 0.5 MILE EAST OF STELLA LINK,
PROJECT ELEV. = 47.35' (CALL ELEV.= 47.14')
TO CONVERT PROJECT ELEVATIONS TO TSARP NAVD88 (2001 ADJ.) SUBTRACT 0.21' FROM PROJECT DATUM.

TEMPORARY BENCHMARK TABLE					
TBM	STA. & OFFSET	Northing	Easting	Elev.	Description
1	1+56.16, 39.40' LT LATMA DR.	13815377.2126	3099036.0639	48.77	CUT X IN CONC
2	3+86.22, 15.46' RT LATMA DR. 1+84.54, 25.92' RT SUN VALLEY DR.	13815332.1213	3099268.2315	47.30	SET 3/8IRwCAP
3	6+47.48, 16.34' RT LATMA DR.	13815313.2043	3099518.9523	48.04	SET 3/8IRwCAP
4	9+92.25, 10.36' LT LATMA DR. 1+10.36, 59.08' RT KAPRI LN.	13815176.1834	3099834.9782	47.88	SET PK NAILwSHINER
5	6+77.92, 28.33' RT KAPRI LN. 12+81.12, 15.39' RT MURWORTH DR.	13815750.8534	3099937.7988	46.72	SET 3/8" IRwCAP
6	5+88.11, 10.29' LT MURWORTH DR.	13815747.2250	3099244.3241	47.85	SET 3/8" IRwCAP
7	12+80.18, 16.31' LT LATMA DR. 2+16.31, 46.78' RT MARLIVE LN.	13815045.9615	3100091.8430	48.32	SET 3/8IRwCAP
8	15+16.49, 12.32' LT LATMA DR. 1+12.32, 17.89' LT DURHILL ST.	13814931.2517	3100298.4857	47.82	SET PK NAILwSHINER
9	1+34.53, 16.74' RT LINKMEADOW LN. 6+10.96, 34.55' LT DURHILL ST.	13815313.0868	3100631.3668	48.70	SET 3/8IRwCAP
10	6+20.21, 20.31' LT LINKMEADOW LN. 18+32.46, 19.74' RT MURWORTH DR.	13815769.8133	3100488.8319	47.54	CUT X IN CONC
11	15+70.92, 21.60' RT MURWORTH DR. 9+31.28, 18.94' RT MARLIVE LN.	13815756.9010	3100227.5974	47.16	CUT X IN CONC
21	3+72.55, 9.86' LT KAPRI LN.	13815449.3625	3099869.9808	47.59	SET CONC NAILwSHINER

FOUND PROPERTY CONRER TABLE				
Point	STA. & OFFSET	Northing	Easting	Description
39	12+63.40, 30.10' LT LATMA DR. 2+30.09, 30.00' RT MARLIVE LN.	13815066.0222	3100083.5238	FND 3/4" PTP
40	12+63.29, 29.34' RT LATMA DR. 1+70.66, 29.89' RT MARLIVE LN.	13815013.6255	3100055.4606	FND 3/4" PTP
41	12+03.99, 29.51' LT LATMA DR. 2+29.51, 29.41' LT MARLIVE LN.	13815093.4571	3100030.8225	FND 3/4" PTP
42	9+63.17, 29.91' LT LATMA DR. 1+29.90, 30.00' RT KAPRI LN.	13815207.1139	3099818.5129	FND 3/4" PTP
43	10+68.58, 29.13' RT LATMA DR.	13815105.4258	3099883.7423	FND 1/2" IR
44	9+38.44, 29.43' RT LATMA DR.	13815166.3913	3099768.7688	FND 3/4" PTP
45	6+69.09, 30.05' LT LATMA DR. 1+28.73, 30.00' RT LATMA CT.	13815345.7987	3099558.6294	FND 3/4" PTP
46	6+14.82, 30.10' LT LATMA DR. 1+28.80, 29.48' LT LATMA CT.	13815368.2263	3099503.5410	FND 3/4" PTP
47	5+85.25, 28.94' RT LATMA DR.	13815318.4148	3099460.2539	FND 5/8" IR
49	3+89.56, 29.41' RT LATMA DR. 1+70.59, 29.26' RT SUN VALLEY DR.	13815318.3283	3099272.1587	FND 5/8" IR
50	3+88.85, 30.24' LT LATMA DR. 2+30.24, 28.55' RT SILVER SPRING LN.	13815377.8901	3099268.9317	FND 3/4" PTP
51	3+30.02, 29.86' LT LATMA DR. 2+29.86, 30.28' LT SILVER SPRING LN.	13815375.0287	3099210.1704	FND 3/4" PTP
52	3+29.78, 28.97' RT LATMA DR. 1+71.03, 30.52' LT SUN VALLEY DR.	13815316.2350	3099212.4125	FND 3/8" IR
53	5+60.69, 27.28' LT SILVER SPRING LN.	13815705.6831	3099199.1861	FND 3/4" PTP
54	5+40.75, 29.71' RT SILVER SPRING LN. 5+98.25, 49.25' RT MURWORTH DR.	13815688.1757	3099256.9707	FND 1/2" IR
55	5+60.78, 49.65' RT SILVER SPRING LN. 6+18.19, 29.22' RT MURWORTH DR.	13815709.0271	3099276.0414	FND 1/2" IR
56	7+32.78, 30.00' LT MURWORTH DR.	13815773.0358	3099388.0245	FND 5/8" IR
57	7+18.23, 29.12' RT MURWORTH DR.	13815713.3529	3099375.9860	FND 1/2" IP
58	9+98.35, 29.61' RT MURWORTH DR.	13815724.7025	3099655.8832	FND 3/8" IRwCAP
59	9+36.89, 30.16' LT MURWORTH DR.	13815781.8176	3099591.9469	FND 3/4" PTP
60	12+76.89, 30.11' LT MURWORTH DR.	13815796.1393	3099931.6463	FND 3/8" IRwCAP
61	6+63.67, 29.99' LT KAPRI LN. 12+22.79, 29.53' RT MURWORTH LN.	13815734.2630	3099880.1206	FND 1/2" IP
63	4+20.58, 30.00' RT KAPRI LN.	13815487.7036	3099919.6888	FND 1/2" IP
64	15+48.99, 29.57' LT MURWORTH DR.	13815807.0962	3100203.5264	FND 1/2" IP
65	16+16.83, 29.59' LT MURWORTH LN.	13815809.9788	3100271.3076	FND 3/4" PTP
66	9+23.10, 30.00' RT MARLIVE LN. 15+81.98, 29.78' RT MURWORTH LN.	13815749.1905	3100238.9958	FND 1/2" IP
68	6+09.98, 29.63' LT LINKMEADOW LN. 18+23.15, 29.98' RT MURWORTH LN.	13815759.1897	3100479.9561	FND 3/4" PTP
69	6+69.95, 29.76' LT LINKMEADOW LN. 18+23.02, 30.00' LT MURWORTH LN.	13815819.1058	3100477.2946	FND 5/8" IR
70	5+94.29, 29.79' RT LINKMEADOW LN.	13815746.0298	3100539.9879	FND 3/4" PTP
72	1+29.07, 30.00' RT LINKMEADOW LN. 6+23.87, 29.56' LT DURHILL ST.	13815315.6254	3100645.4124	FND 3/4" PTP
73	1+29.87, 29.65' LT LINKMEADOW LN. 5+66.15, 30.38' LT DURHILL ST.	13815284.5837	3100594.4701	FND 1/2" IR
74	5+88.70, 29.92' RT DURHILL ST.	13815246.5509	3100646.4217	FND 3/4" PTP
75	6+60.14, 29.68' RT DURHILL ST.	13815281.5531	3100705.9231	FND 1/2" IP

STATE OF TEXAS REGISTERED PAUL W. WAN 4978 PROFESSIONAL LAND SURVEYOR

Paul Wan 12/7/2011

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CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

West Survey Control Map

WBS NO. N-000378-0002-4

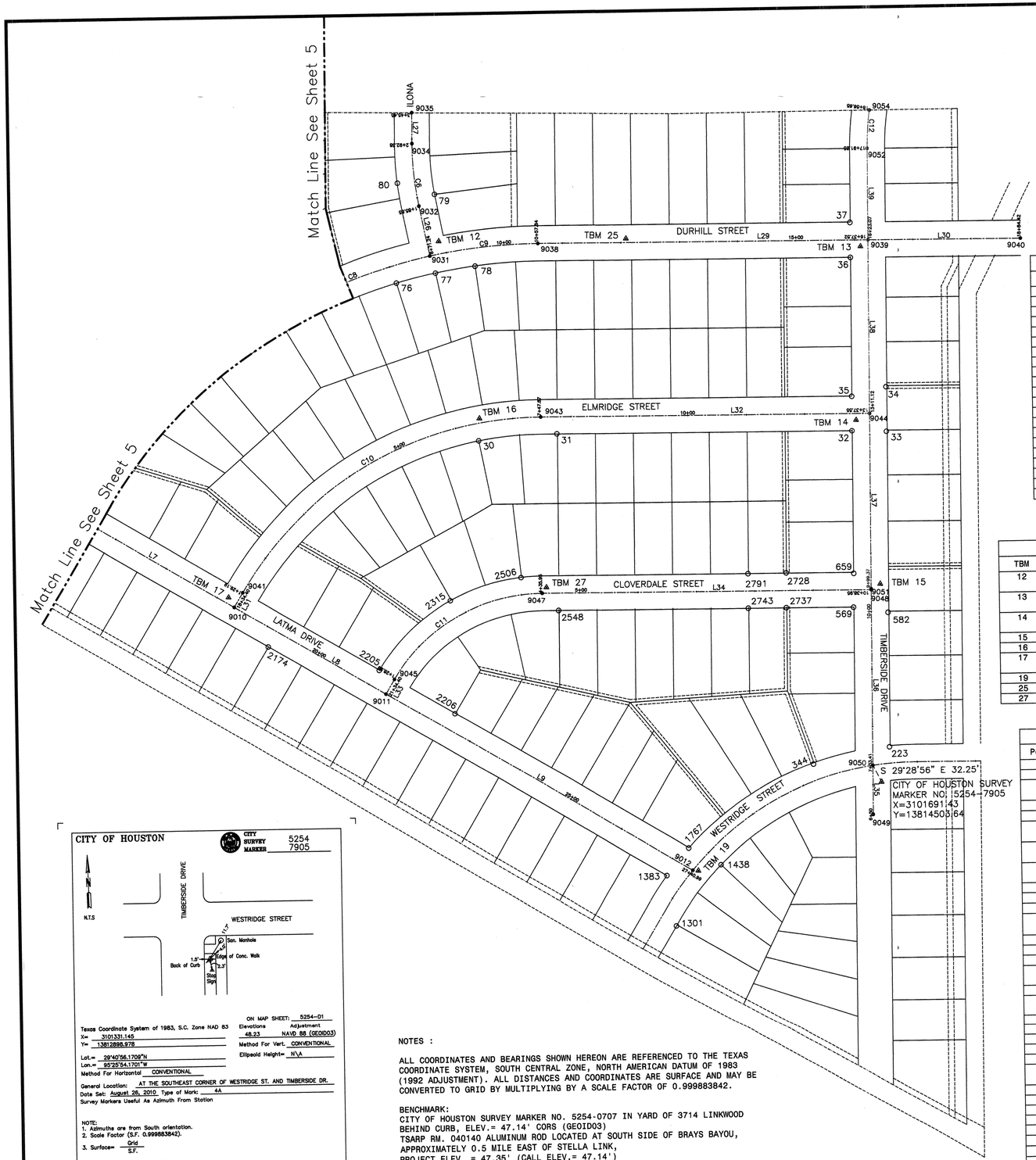
DRAWING SCALE
VERT: NA HORZ:1"=100'

CITY OF HOUSTON PM
MARK BOARD, P.E.

SHEET No: 5 OF 122

FOR CITY OF HOUSTON USE ONLY

PUBLIC WORKS AND ENGINEERING REVIEWED AND FILED 48978 LICENSE NUMBER STATE OF TEXAS



CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	CHORD BEARING	CHORD
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L38	299.98	N02°25'19"W
L39	153.72	N02°25'19"W

DESIGN BASELINE POINT TABLE			
Point	Northing	Easting	Description
9010	13814770.8003	3100573.2049	SET NAIL W/SHINER (INT. LATMA/ELMRIDGE)
9011	13814629.6456	3100837.9224	SET NAIL W/SHINER (INT. LATMA/CLOVERDALE)
9012	13814344.2347	3101373.1737	CUT X IN CONC. (INT. LATMA/WESTRIDGE)
9031	13815383.8825	3100888.3750	SET NAIL W/SHINER (INT. DURHILL/ILONA)
9032	13815467.0113	3100866.9355	SET NAIL W/SHINER (ILONA BL PC)
9034	13815572.2073	3100851.4538	SET NAIL W/SHINER (ILONA BL PT)
9035	13815625.2328	3100849.3404	SET NAIL W/SHINER (ILONA BL END)
9038	13815411.1408	3101072.6349	SET NAIL W/SHINER (DURHILL BL PT)
9039	13815435.0252	3101637.3538	SET NAIL W/SHINER (INT. DURHILL/TIMBERSIDE)
9040	13815446.0691	3101898.4711	SET NAIL W/SHINER (DURHILL BL END)
9041	13814796.5641	3100586.9296	SET NAIL W/SHINER (ELMRIDGE BL PC)
9043	13815111.5137	3101087.2834	SET NAIL W/SHINER (ELMRIDGE BL PT)
9044	13815135.3148	3101650.0299	SET NAIL W/SHINER (INT. ELMRIDGE/TIMBERSIDE)
9045	13814655.2284	3100851.5506	SET NAIL W/SHINER (CLOVERDALE BL PC)
9047	13814811.4945	3101099.8074	SET MAG NAIL (CLOVERDALE BL PT)
9048	13814835.3025	3101662.7187	SET NAIL W/SHINER (INT. CLOVERDALE/TIMBERSIDE)
9049	13814448.3835	3101679.0832	CUT X IN CONC. (TIMBERSIDE BL BEGIN)
9050	13814531.7178	3101675.5587	CUT X IN CONC. (INT. TIMBERSIDE/WESTRIDGE)
9051	13814836.9832	3101662.6476	SET NAIL W/SHINER (TIMBERSIDE BL PI)
9052	13815588.6121	3101630.8579	SET NAIL W/SHINER (TIMBERSIDE BL PC)
9054	13815653.9483	3101632.3696	SET MAG NAIL (TIMBERSIDE BL PT/END)

TEMPORARY BENCHMARK TABLE					
TBM	STA. & OFFSET	Northing	Easting	Elev.	Description
12	8+90.85, 21.61' LT DURHILL ST. 1+21.37, 20.11' RT ILONA	13815409.5990	3100902.5109	47.91	CUT X IN CONC
13	16+10.25, 11.17' RT DURHILL ST. 16+26.36, 12.82' LT TIMBERSIDE DR.	13815423.3288	3101625.0205	46.88	SET PK NAILwSHINER
14	12+87.90, 11.28' RT ELMRIDGE ST. 13+26.27, 23.22' LT TIMBERSIDE DR.	13815123.0648	3101627.3029	47.10	SET PK NAILwSHINER
15	10+47.19, 15.59' RT TIMBERSIDE DR.	13814845.8731	3101677.8732	48.15	SET 3/8IRwCAP
16	6+43.69, 7.87' LT ELMRIDGE ST.	13815105.7375	3100982.4117	49.01	SET PK NAILwSHINER
17	18+17.34, 10.02' LT LATMA DR. 1+10.02, 17.05' LT ELMRIDGE ST.	13814787.6635	3100562.8686	48.78	SET PK NAILwSHINER
19	WESTRIDGE ST.	13814343.7791	3101382.5904	49.10	CUT X IN CONC
25	12+08.53, 6.85' LT DURHILL DR.	13815424.3558	3101222.8992	47.96	SET CONC NAILwSHINER
27	4+43.14, 10.08' LT CLOVERDALE ST.	13814821.8645	3101106.5611	48.72	SET CONC NAILwSHINER

FOUND PROPERTY CONRER TABLE				
Point	STA. & OFFSET	Northing	Easting	Description
30	6+34.98, 30.00' RT ELMRIDGE ST.	13815066.9177	3100982.5044	FND 5/8" IR
31	7+75.35, 29.78' RT ELMRIDGE ST.	13815082.9219	3101115.9943	FND 3/4" PTP
32	12+80.81, 30.00' RT ELMRIDGE ST. 13+07.55, 30.31' LT TIMBERSIDE DR.	13815104.0606	3101621.0120	FND 3/4" PTP
33	13+06.12, 28.64' RT TIMBERSIDE DR.	13815105.1240	3101679.9723	FND 1/2" IRwCAP GULLET ASSOC
34	13+83.18, 28.64' RT TIMBERSIDE DR.	13815182.1180	3101676.7108	FND 1/2" IRwCAP GULLET ASSOC
35	12+80.97, 29.65' LT ELMRIDGE ST. 13+67.19, 30.15' LT TIMBERSIDE DR.	13815163.6606	3101618.6541	FND 3/4" PTP
36	15+92.81, 30.00' RT DURHILL ST. 16+07.52, 30.26' LT TIMBERSIDE DR.	13815403.7736	3101608.3935	FND 3/4" PTP
37	15+92.56, 29.35' LT DURHILL ST. 16+66.87, 30.51' LT TIMBERSIDE DR.	13815463.0547	3101605.6334	FND 3/4" PTP
76	8+03.01, 30.02' RT DURHILL ST.	13815335.9725	3100832.6776	FND 3/8" IR
77	9+74.48, 30.37' RT DURHILL ST.	13815355.2467	3100898.9663	FND 3/8" IR
78	9+45.78, 30.60' RT DURHILL ST.	13815369.2288	3100966.3740	FND 1/2" IR
79	8+98.31, 99.60' LT DURHILL ST. 1+99.96, 30.00' RT ILONA	13815487.3916	3100892.8537	FND 1/2" IR
80	2+29.39, 29.44' LT ILONA	13815504.7402	3100828.8732	FND 1/2" IR
223	7+65.06, 28.89' RT TIMBERSIDE DR.	13814564.5633	3101703.0885	FND 3/4" PTP
344	WESTRIDGE ST.	13814530.5592	3101573.9244	FND 3/4" PTP
569	9+68.89, 30.00' RT CLOVERDALE ST. 10+07.26, 30.48' LT TIMBERSIDE DR.	13814804.0415	3101633.5375	FND 3/4" PTP
582	9+98.18, 28.61' RT TIMBERSIDE DR.	13814797.4647	3101692.9539	FND 1/2" IR
659	9+69.84, 28.38' LT CLOVERDALE ST. 10+65.64, 29.53' LT TIMBERSIDE DR.	13814862.4050	3101632.0160	FND 1/2" IP
1301	WESTRIDGE ST.	13814248.0985	3101348.2126	FND 3/4" PTP
1383	27+07.09, 30.00' RT LATMA DR.	13814333.7149	3101329.1425	FND 3" IP
1438	WESTRIDGE ST.	13814355.3283	3101421.1615	FND 3/4" PTP
1767	27+15.99, 29.26' LT LATMA DR.	13814381.8157	3101364.8767	FND 3/4" PTP
2174	19+19.08, 30.30' RT LATMA DR.	13814704.2166	3100633.6743	FND 5/8" IR
2205	21+04.12, 29.50' LT LATMA DR. 1+29.46, 30.26' LT CLOVERDALE ST.	13814669.9178	3100825.0875	FND 3/4" PTP
2206	22+54.01, 29.18' LT LATMA DR.	13814599.1136	3100957.1980	FND 3/4" PTP
2315	2+86.39, 29.67' LT CLOVERDALE ST.	13814793.7346	3100942.7679	FND 1" PTP
2506	4+03.06, 29.58' LT CLOVERDALE ST.	13814837.5111	3101062.5603	FND 3/4" PTP
2548	4+63.67, 29.90' RT CLOVERDALE ST.	13814859.6752	3101128.7611	FND 3/4" PTP
2728	8+53.93, 30.55' LT CLOVERDALE ST.	13814782.7924	3101516.1146	FND 3/4" PTP
2737	8+53.78, 29.56' RT CLOVERDALE ST.	13814799.6162	3101518.5145	FND 3/4" PTP
2743	7+88.62, 29.71' RT CLOVERDALE ST.	13814796.7090	3101453.4110	FND 5/8" IR
2791	7+88.68, 29.92' LT CLOVERDALE ST.	13814856.2934	3101450.9515	FND 3/4" PTP

CITY OF HOUSTON

CITY SURVEY MARKER 5254 7905

ON MAP SHEET: 5254-01

Texas Coordinate System of 1983, S.C. Zone NAD 83 — Elevations Adjustment: 48.23 NAVD 88 (GEOID03)

X= 3101331.145

Y= 13812898.978

Method For Vert. CONVENTIONAL

Lat.= 29°40'56.1709"N

Lon.= 95°25'54.1701"W

Ellipsoid Height= N\A

Method For Horizontal CONVENTIONAL

General Location: AT THE SOUTHEAST CORNER OF WESTRIDGE ST. AND TIMBERSIDE DR.

Date Set: August 28, 2010 Type of Mark: 4A

Survey Markers Useful As Azimuth From Station

NOTE:
1. Azimuths are from South orientation.
2. Scale Factor (S.F. 0.999883842).

3. Surface= Grid / S.F.

Surveyed By: LANDTECH CONSULTANTS
2525 N. LOOP W. STE 300
Houston, TX 77008

City of Houston, Harris County, Texas

NOTES :

ALL COORDINATES AND BEARINGS SHOWN HEREON ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM, SOUTH CENTRAL ZONE, NORTH AMERICAN DATUM OF 1983 (1992 ADJUSTMENT). ALL DISTANCES AND COORDINATES ARE SURFACE AND MAY BE CONVERTED TO GRID BY MULTIPLYING BY A SCALE FACTOR OF 0.999883842.

BENCHMARK:
CITY OF HOUSTON SURVEY MARKER NO. 5254-0707 IN YARD OF 3714 LINKWOOD BEHIND CURB, ELEV.= 47.14' CORS (GEOID03)
TSARP RM. 040140 ALUMINUM ROD LOCATED AT SOUTH SIDE OF BRAYS BAYOU, APPROXIMATELY 0.5 MILE EAST OF STELLA LINK,
PROJECT ELEV. = 47.35' (CALL ELEV.= 47.14')
TO CONVERT PROJECT ELEVATIONS TO TSARP NAVD88 (2001 ADJ.) SUBTRACT 0.21' FROM PROJECT DATUM.

STATE OF TEXAS
REGISTERED
PAUL K. MAN
5314
PROFESSIONAL
LAND SURVEYOR

Paul Kman
14/7/2011

mp

HDR | CLAUNCH & MILLER
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SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 | Dwn By:

Date: May 2011 | Chkd By: D. Jorgensen

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

East Survey Control Map

WBS NO.
N-000378-0002-4

DRAWING SCALE
VERT: NA HORZ: 1"=100'

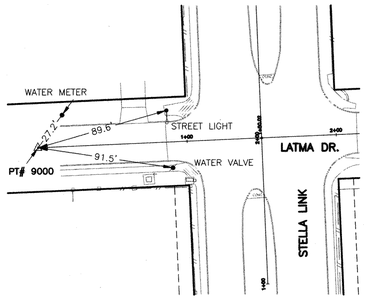
CITY OF HOUSTON PM
MARK BOARD, P.E.

FOR CITY OF HOUSTON USE ONLY

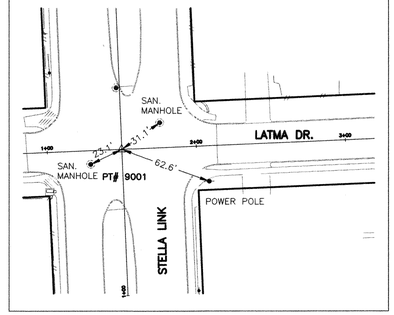
PUBLIC WORKS AND ENGINEERING
ACCEPTED FILED
48978
NUMBER

SHEET No: 6 OF 122

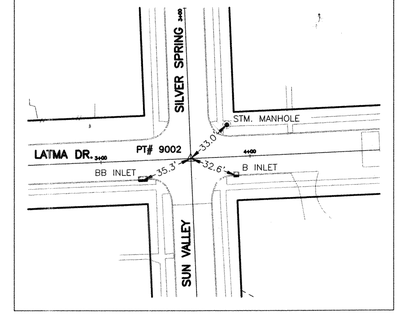
LATMA DR. @ STA. 0+00.00



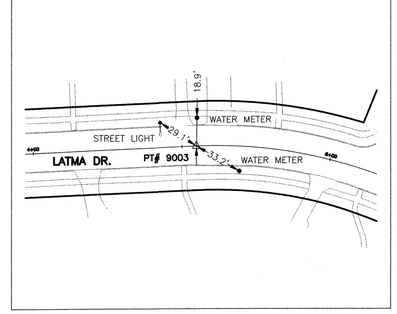
INTERSECTION OF
LATMA DR. @ STA. 1+50.02
STELLA LINK @ STA. 2+00



INTERSECTION OF
LATMA DR. @ STA. 3+60.30
SUN VALLEY & SILVER SPRING @ STA. 2+00

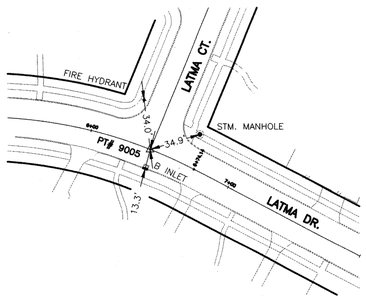


LATMA DR. @ STA. 5+09.71

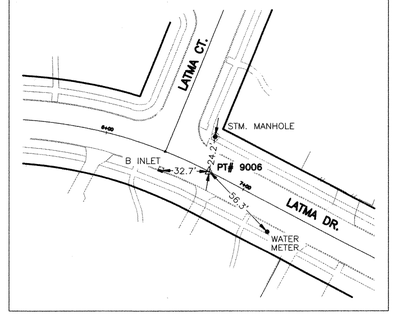


N.T.S.

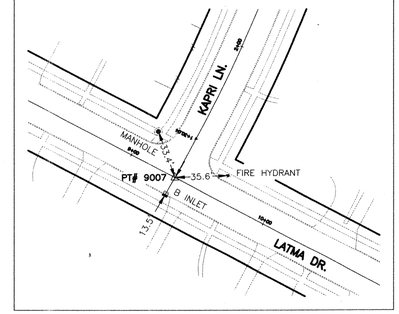
INTERSECTION OF
LATMA DR. @ STA. 6+41.70
& LATMA CT. @ STA. 1+00



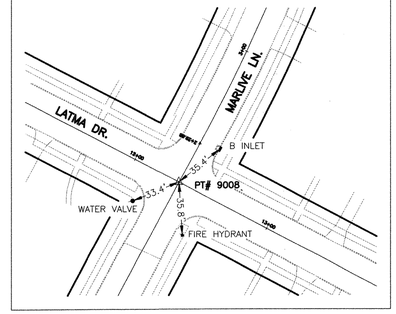
LATMA DR. @ STA. 6+74.14



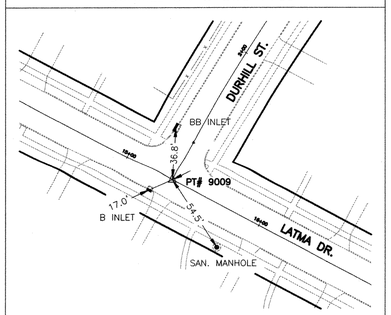
INTERSECTION OF
LATMA DR. @ STA. 9+33.17
KAPRI LN. @ STA. 1+00



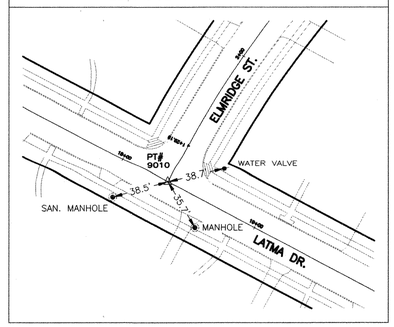
INTERSECTION OF
LATMA DR. @ STA. 12+33.40
MARLIVE LN. @ STA. 2+00



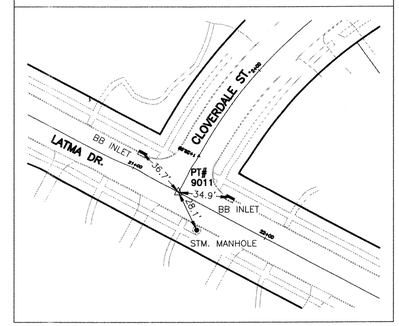
INTERSECTION OF
LATMA DR. @ STA. 15+34.39
DURHILL ST. @ STA. 1+00



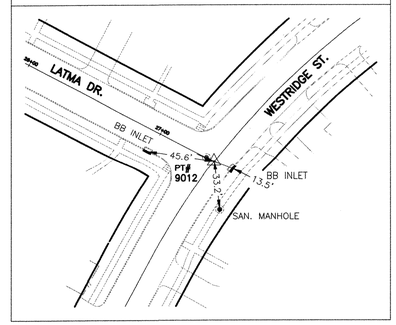
INTERSECTION OF
LATMA DR. @ STA. 18+34.40
ELMRIDGE ST. @ STA. 1+00



INTERSECTION OF
LATMA DR. @ STA. 21+34.40
CLOVERDALE ST. @ STA. 1+00



INTERSECTION OF
LATMA DR. @ STA. 27+40.99
AND WESTRIDGE ST.



10/12/2011

CLAUNCH & MILLER
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JOHN D. RUDLOFF
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SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 | Dwn By:
Date: May 2011 | Chkd By: D. Jorgensen

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Survey Control Swing Ties

WBS NO.
N-000378-0002-4

DRAWING SCALE
VERT: NA HORZ: NA

CITY OF HOUSTON PM
MARK BOARD, P.E.

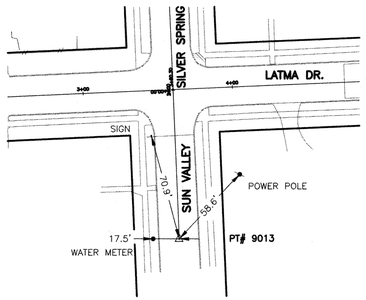
SHEET No: 7 OF 122

FOR CITY OF HOUSTON USE ONLY

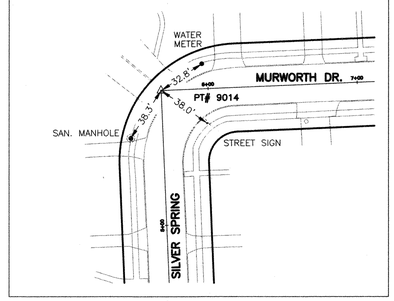
PUBLIC WORKS AND ENGINEERING
REVIEWED AND FILED
48978
NUMBER
TEXAS

MB

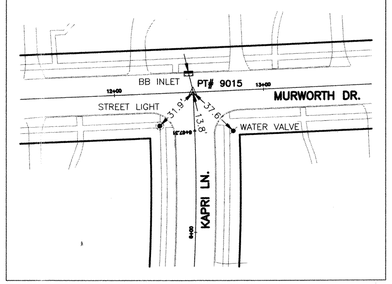
SUN VALLEY DR. @ STA. 1+00.00



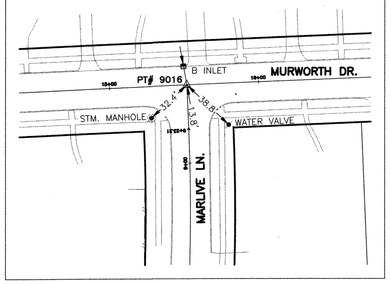
INTERSECTION OF
SILVER SPRING @ STA. 5+90.00
MURWORTH DR. @ STA. 5+68.54



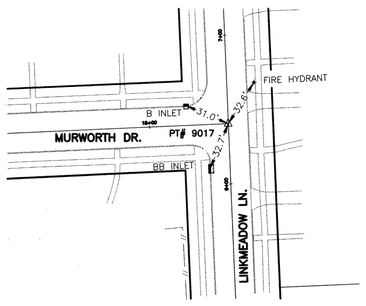
INTERSECTION OF
MURWORTH DR. @ STA. 12+52.19
KAPRI LN. @ STA. 6+93.31



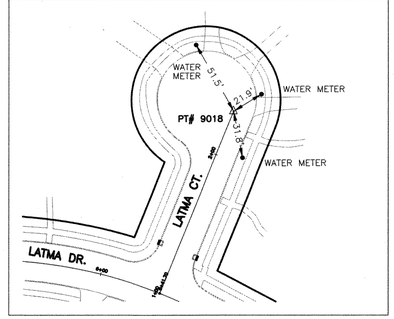
INTERSECTION OF
MURWORTH DR. @ STA. 15+51.98
MARLIVE LN. @ STA. 9+52.88



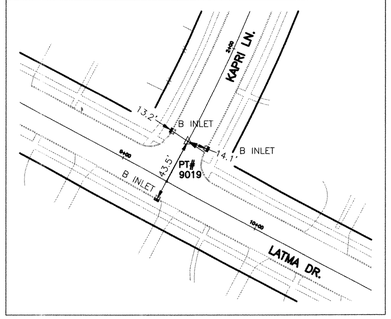
INTERSECTION OF
MURWORTH DR. @ STA. 18+52.78
LINKMEADOW LN. @ STA. 6+39.95



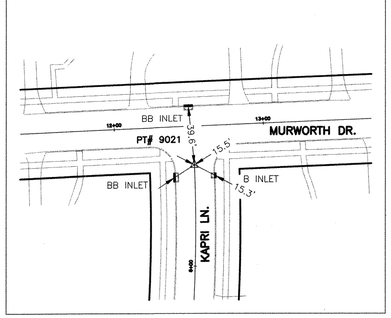
LATMA LN. @ STA. 2+31.45



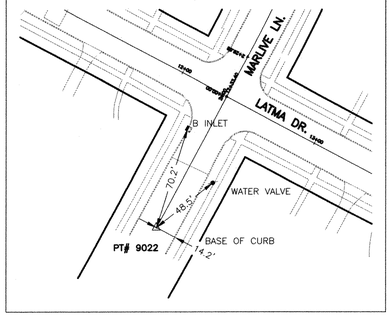
KAPRI LN. @ STA. 1+30.04



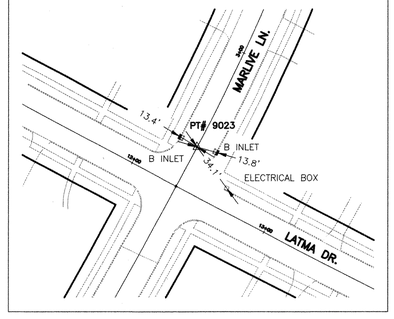
KAPRI LN. @ STA. 6+67.31



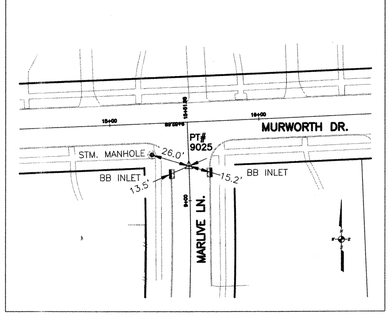
MARLIVE LN. @ STA. 1+00.00



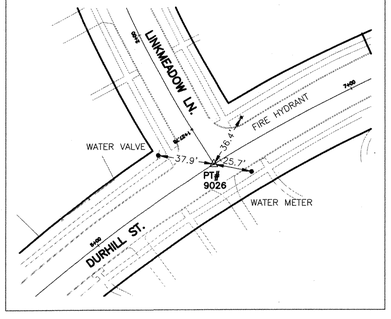
MARLIVE LN. @ STA. 2+29.88

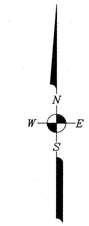


MARLIVE LN. @ STA. 9+23.21



INTERSECTION OF
DURHILL ST. @ STA. 5+94.88
LINKMEADOW LN. @ STA. 1+00





N.T.S.



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DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

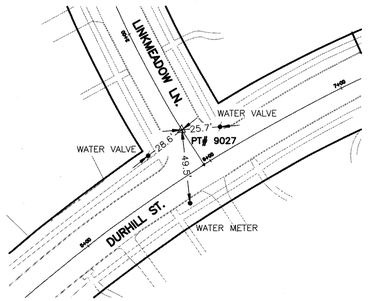
Survey Control Swing Ties

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	
DRAWING SCALE	
VERT: NA HORZ: NA	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	
SHEET No: 8 OF 122	

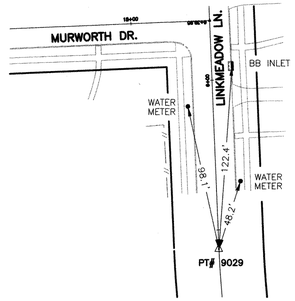


MB

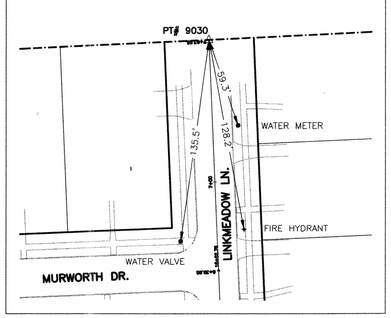
LINKMEADOW LN. @ STA. 1+00



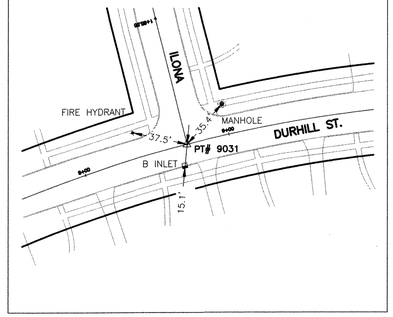
LINKMEADOW LN. @ STA. 4+87.29



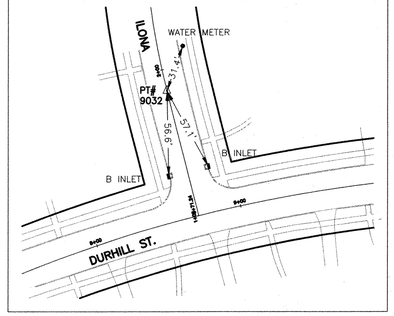
LINKMEADOW LN. @ STA. 7+93.95



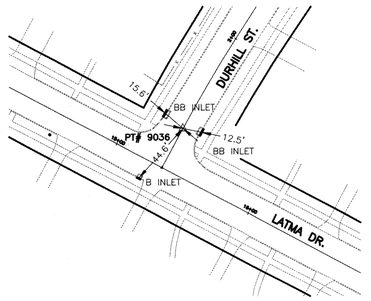
INTERSECTION OF
DURHILL ST. @ STA. 8+71.24
ILONA @ STA. 1+00



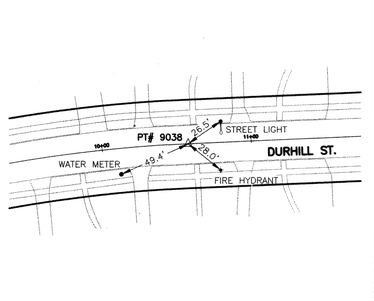
ILONA @ STA. 1+85.85



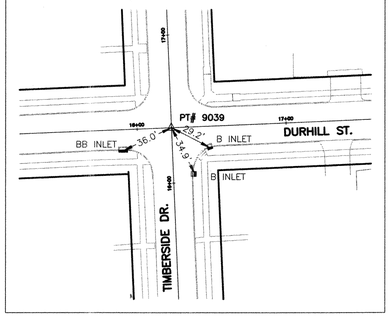
DURHILL ST. @ STA. 1+29.95



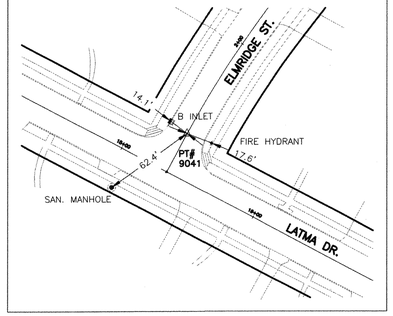
DURHILL ST. @ STA. 10+57.84



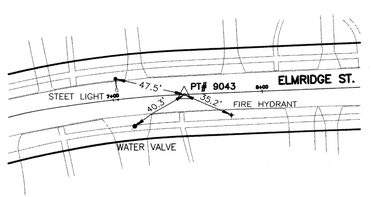
INTERSECTION OF
DURHILL ST. @ STA. 16+23.07
TIMBERSIDE DR. @ STA. 16+37.52



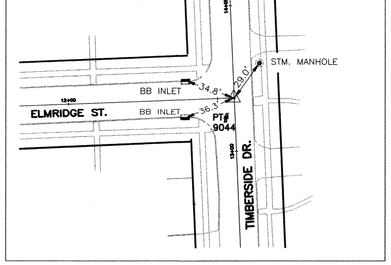
ELMRIDGE ST. @ STA. 1+29.19



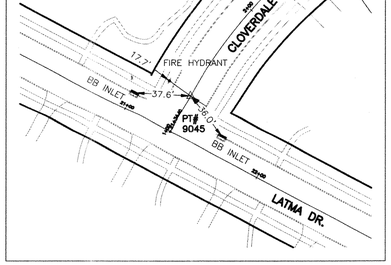
ELMRIDGE ST. @ STA. 7+47.87



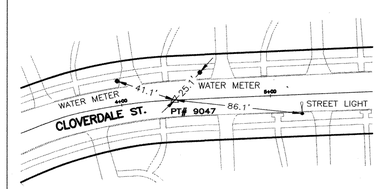
INTERSECTION OF
ELMRIDGE ST. @ STA. 13+11.12
TIMBERSIDE DR. @ STA. 13+37.55



CLOVERDALE ST. @ STA. 1+28.99



CLOVERDALE ST. @ STA. 4+35.95



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FB NO. PB#5543

Job No.: 09-051 | Dwn By:

Date: May 2011 | Chkd By: D. Jorgensen

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DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Survey Control Swing Ties

WBS NO.
N-000378-0002-4

DRAWING SCALE
VERT: NA HORZ: NA

CITY OF HOUSTON PM
MARK BOARD, P.E.

SHEET No: 9 OF 122

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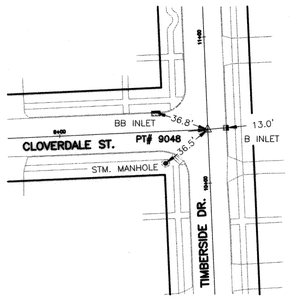
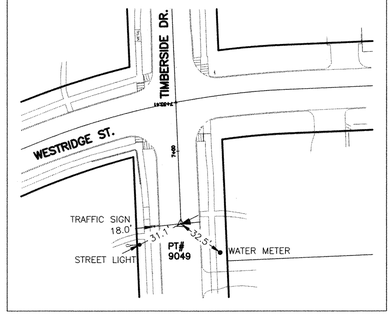
STATE OF TEXAS

MB

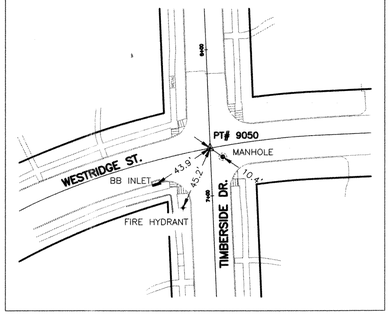
CLOVERDALE ST. @ STA. 9+99.37



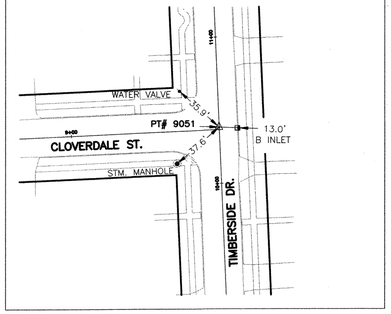
TIMBERSIDE DR. @ STA. 6+50.00



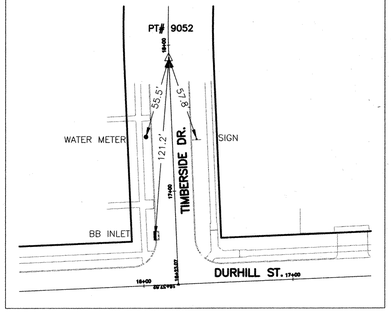
INTERSECTION OF
TIMBERSIDE DR. @ STA. 7+33.41
AND WESTRIDGE ST.



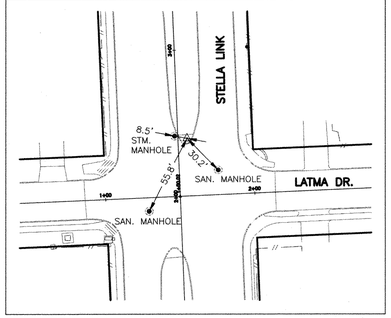
TIMBERSIDE DR. @ STA. 10+38.95



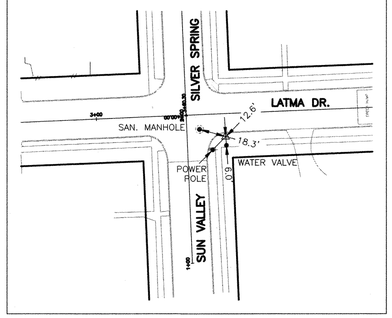
TIMBERSIDE DR. @ STA. 17+91.25



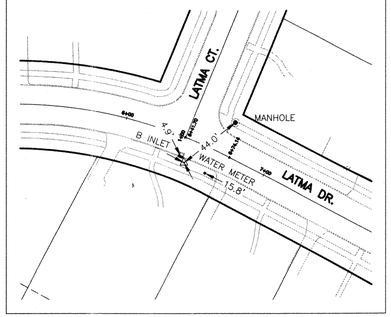
TBM 1
LATMA DR. @ STA. 1+56.16, 39.40' LT.



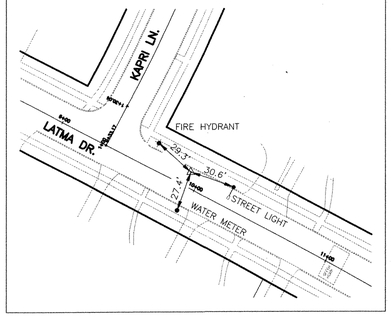
TBM 2
LATMA DR. @ STA. 3+86.22, 15.46' RT.
SUN VALLEY DR. @ STA. 1+84.54, 25.92' RT.



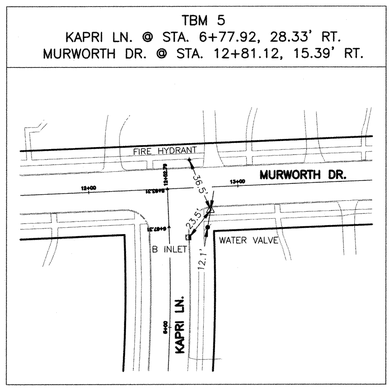
TBM 3
LATMA DR. @ STA. 6+47.48, 16.34' RT



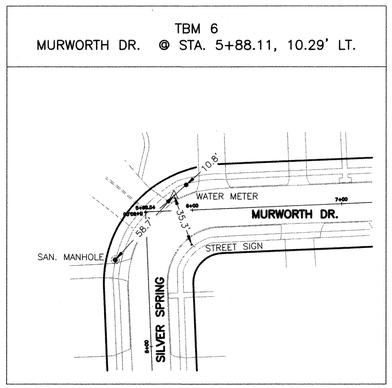
TBM 4
LATMA DR. @ STA. 9+92.25, 10.36' LT.
KAPRI LN. @ STA. 1+10.36, 59.08' RT.



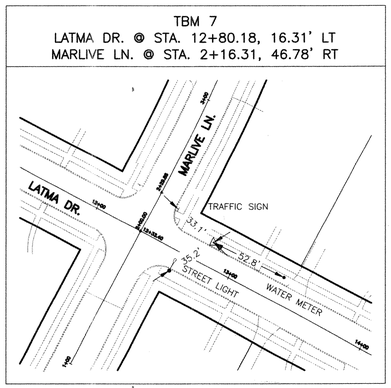
TBM 5
KAPRI LN. @ STA. 6+77.92, 28.33' RT.
MURWORTH DR. @ STA. 12+81.12, 15.39' RT.



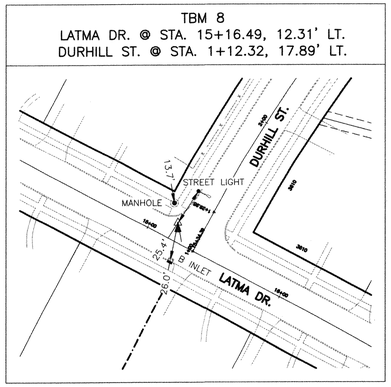
TBM 6
MURWORTH DR. @ STA. 5+88.11, 10.29' LT.



TBM 7
LATMA DR. @ STA. 12+80.18, 16.31' LT
MARLIVE LN. @ STA. 2+16.31, 46.78' RT



TBM 8
LATMA DR. @ STA. 15+16.49, 12.31' LT.
DURHILL ST. @ STA. 1+12.32, 17.89' LT.



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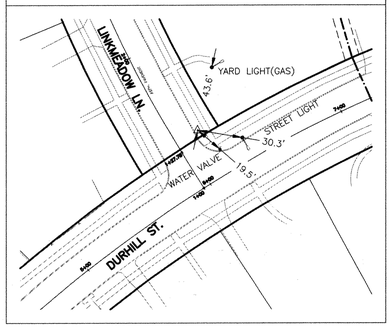
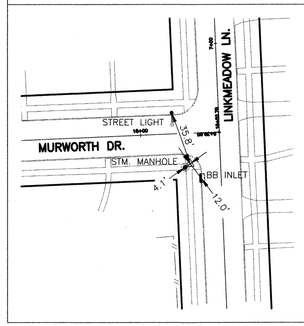
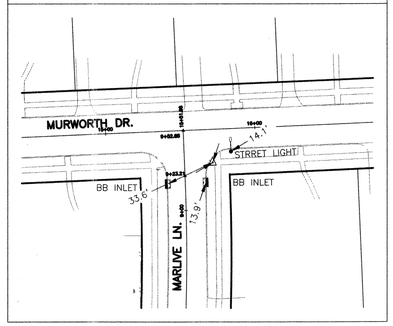
TBM 9
DURHILL ST. @ STA. 6+10.96, 34.55' LT.
LINKMEADOW LN. @ STA. 1+34.53, 16.74' RT.



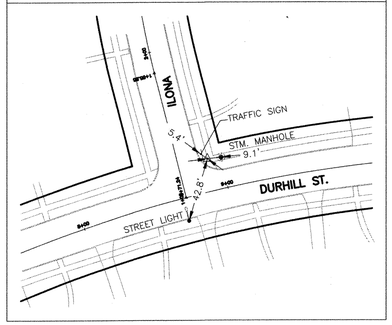
TBM 10
LINKMEADOW LN. @ STA. 6+20.21, 20.31' LT.
MURWORTH DR. @ STA. 18+32.46, 19.74' RT.



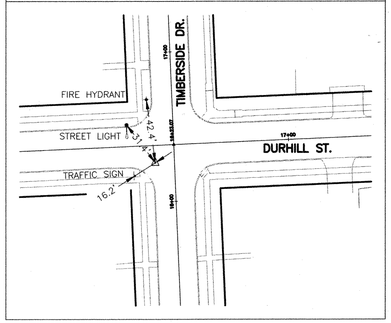
TBM 11
MARLIVE LN. @ STA. 9+31.28, 18.94' RT.
MURWORTH LN. @ STA. 15+70.92, 21.60' RT.



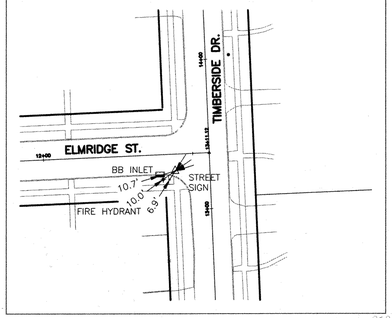
TBM 12
DURHILL ST. @ STA. 8+90.85, 21.61' LT.
ILONA @ STA. 1+21.37, 20.11' RT.



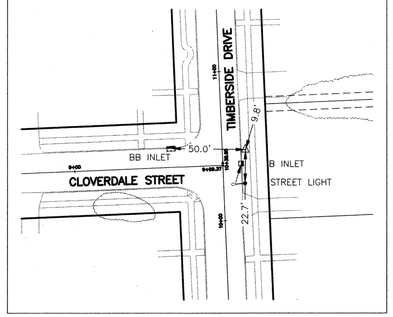
TBM 13
DURHILL ST. @ STA. 16+10.25, 11.17' RT.
TIMBERSIDE DR. @ STA. 16+26.36, 12.82' LT.



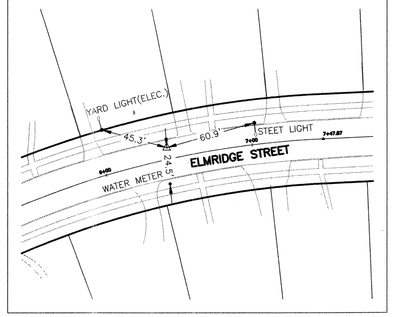
TBM 14
ELMRIDGE ST. @ STA. 12+87.90, 11.28' RT.
TIMBERSIDE DR. @ STA. 13+26.27, 23.22' LT.



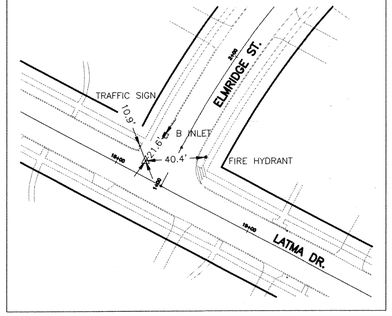
TBM 15
TIMBERSIDE DR. @ STA. 10+47.19, 15.59' RT.



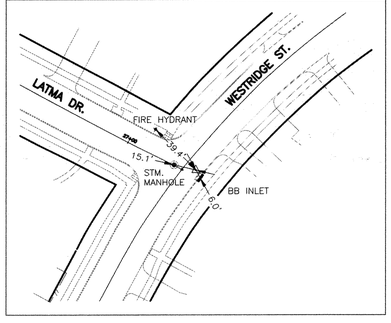
TBM 16
ELMRIDGE ST. @ STA. 6+43.69, 7.87' LT.



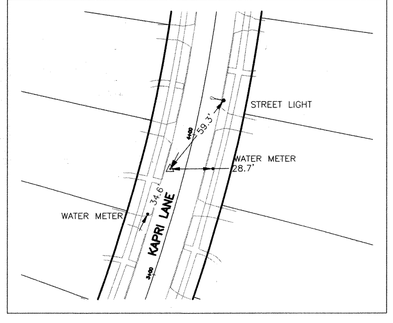
TBM 17
LATMA DR. @ STA. 18+17.34, 10.02' LT.
ELMRIDGE ST. @ STA. 1+10.02, 17.05' LT.



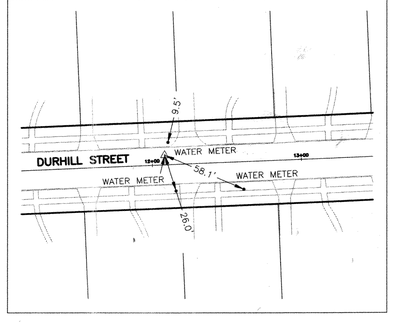
TBM 19
@ INTERSECTION OF LATMA DR. AND WESTRIDGE ST.



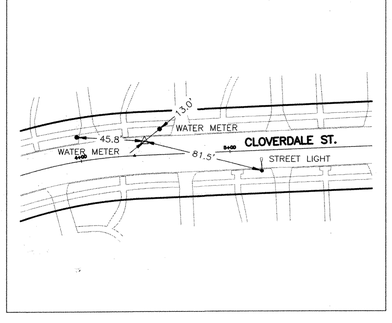
TBM 21
KAPRI LN. @ STA. 3+72.55, 9.86' LT.



TBM 25
DURHILL DR. @ STA. 12+08.53, 6.85' LT.



TBM 27
CLOVERDALE ST. @ STA. 4+43.14, 10.08' LT.



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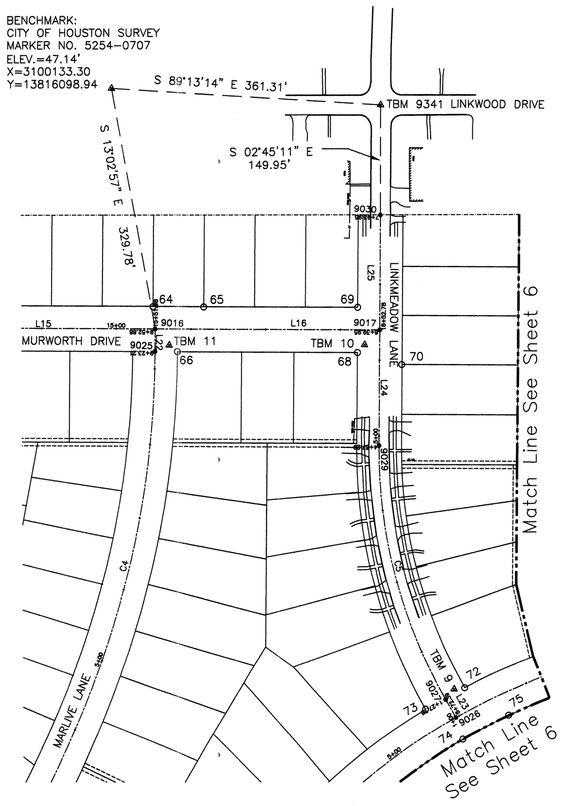
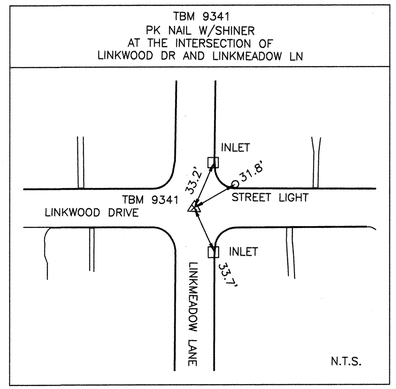
CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	CHORD BEARING	CHORD
C4	693.33	1302.89	30°29'23"	N12°49'23"E	685.17
C5	359.51	690.22	29°50'36"	S17°20'37"E	355.46

DESIGN BASELINE POINT TABLE			
Point	Northing	Easting	Description
9016	13815777.6794	3100207.7640	SET COTTON SPINDLE (INT. MURWORTH/MARLIVE)
9017	13815790.3900	3100508.2918	SET NAIL w/SHINER (INT. MURWORTH/LINKMEADOW)
9025	13815748.0339	3100209.0179	SET NAIL w/SHINER (MARLIVE BL PT)
9026	13815275.0763	3100635.5337	SET NAIL w/SHINER (INT. DURHILL/LINKMEADOW)
9027	13815298.5642	3100620.7052	SET NAIL w/SHINER (LINKMEADOW BL PC)
9029	13815637.8632	3100514.7428	SET COTTON SPINDLE (LINKMEADOW BL PT)
9030	13815944.2539	3100501.7842	SET NAIL w/SHINER (LINKMEADOW BL END)

FOUND PROPERTY CONRER TABLE				
Point	STA. & OFFSET	Northing	Easting	Description
64	15+48.99, 29.57' LT MURWORTH DR.	13815807.0962	3100203.5264	FND 1/2" IP
65	16+16.83, 29.59' LT MURWORTH LN.	13815809.9788	3100271.3076	FND 3/4" PTP
66	9+23.10, 30.00' RT MARLIVE LN. 15+81.98, 29.78' RT MURWORTH LN.	13815749.1905	3100238.9958	FND 1/2" IP
68	6+09.98, 29.63' LT LINKMEADOW LN. 18+23.15, 29.98' RT MURWORTH LN.	13815759.1897	3100479.9561	FND 3/4" PTP
69	6+69.95, 29.76' LT LINKMEADOW LN. 18+23.02, 30.00' LT MURWORTH LN.	13815819.1058	3100477.2946	FND 5/8" IR
70	5+94.29, 29.79' RT LINKMEADOW LN.	13815746.0298	3100539.9879	FND 3/4" PTP
72	1+29.07, 30.00' RT LINKMEADOW LN. 6+23.87, 29.56' LT DURHILL ST.	13815315.6254	3100645.4124	FND 3/4" PTP
73	1+29.87, 29.65' LT LINKMEADOW LN. 5+66.15, 30.38' LT DURHILL ST.	13815284.5837	3100594.4701	FND 1/2" IR
74	5+88.70, 29.92' RT DURHILL ST.	13815246.5509	3100646.4217	FND 3/4" PTP
75	6+60.14, 29.68' RT DURHILL ST.	13815281.5531	3100705.9231	FND 1/2" IP

TEMPORARY BENCHMARK TABLE					
TBM	STA. & OFFSET	Northing	Easting	Elev.	Description
9	1+34.53, 16.74' RT LINKMEADOW LN. 6+10.96, 34.55' LT DURHILL ST.	13815313.0868	3100631.3668	48.70	SET 3/8IRwCAP
10	6+20.21, 20.31' LT LINKMEADOW LN. 18+32.46, 19.74' RT MURWORTH DR.	13815769.8133	3100488.8319	47.54	CUT X IN CONC
11	15+70.92, 21.60' RT MURWORTH DR. 9+31.28, 18.94' RT MARLIVE LN.	13815756.9010	3100227.5974	47.16	CUT X IN CONC
9341	(LINKWOOD DR. & LINKMEADOW LN.)	13816094.0279	3100494.5821	48.19	PK NAIL w/SHINER





LINE TABLE		
LINE	LENGTH	BEARING
L15	299.19	N87°34'41"E
L16	300.80	N87°34'41"E
L22	29.67	N02°25'19"W
L23	27.78	N32°15'54"W
L24	152.66	N02°25'19"W
L25	154.00	N02°25'19"W

NOTES :

ALL COORDINATES AND BEARINGS SHOWN HEREON ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM, SOUTH CENTRAL ZONE, NORTH AMERICAN DATUM OF 1983 (1992 ADJUSTMENT). ALL DISTANCES AND COORDINATES ARE SURFACE AND MAY BE CONVERTED TO GRID BY MULTIPLYING BY A SCALE FACTOR OF 0.999883842.

BENCHMARK:
CITY OF HOUSTON SURVEY MARKER NO. 5254-0707 IN YARD OF 3714 LINKWOOD BEHIND CURB, ELEV.= 47.14' CORS (GEOID03)
TSARP RM. 040140 ALUMINUM ROD LOCATED AT SOUTH SIDE OF BRAYS BAYOU, APPROXIMATELY 0.5 MILE EAST OF STELLA LINK,
PROJECT ELEV. = 47.35' (CALL ELEV.= 47.14')
TO CONVERT PROJECT ELEVATIONS TO TSARP NAVD88 (2001 ADJ.) SUBTRACT 0.21' FROM PROJECT DATUM.

STATE OF TEXAS
JOHN D. RUDLOFF
LICENSED
PROFESSIONAL
ENGINEER
AND SURVEYOR

Paul Rudloff
12/7/2011

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SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 | Dwn By:
Date: May 2011 | Chkd By: D. Jorgensen

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Additional Survey Control Map

WBS NO.
N-000378-0002-4

DRAWING SCALE
VERT: NA HORZ:1"=100'

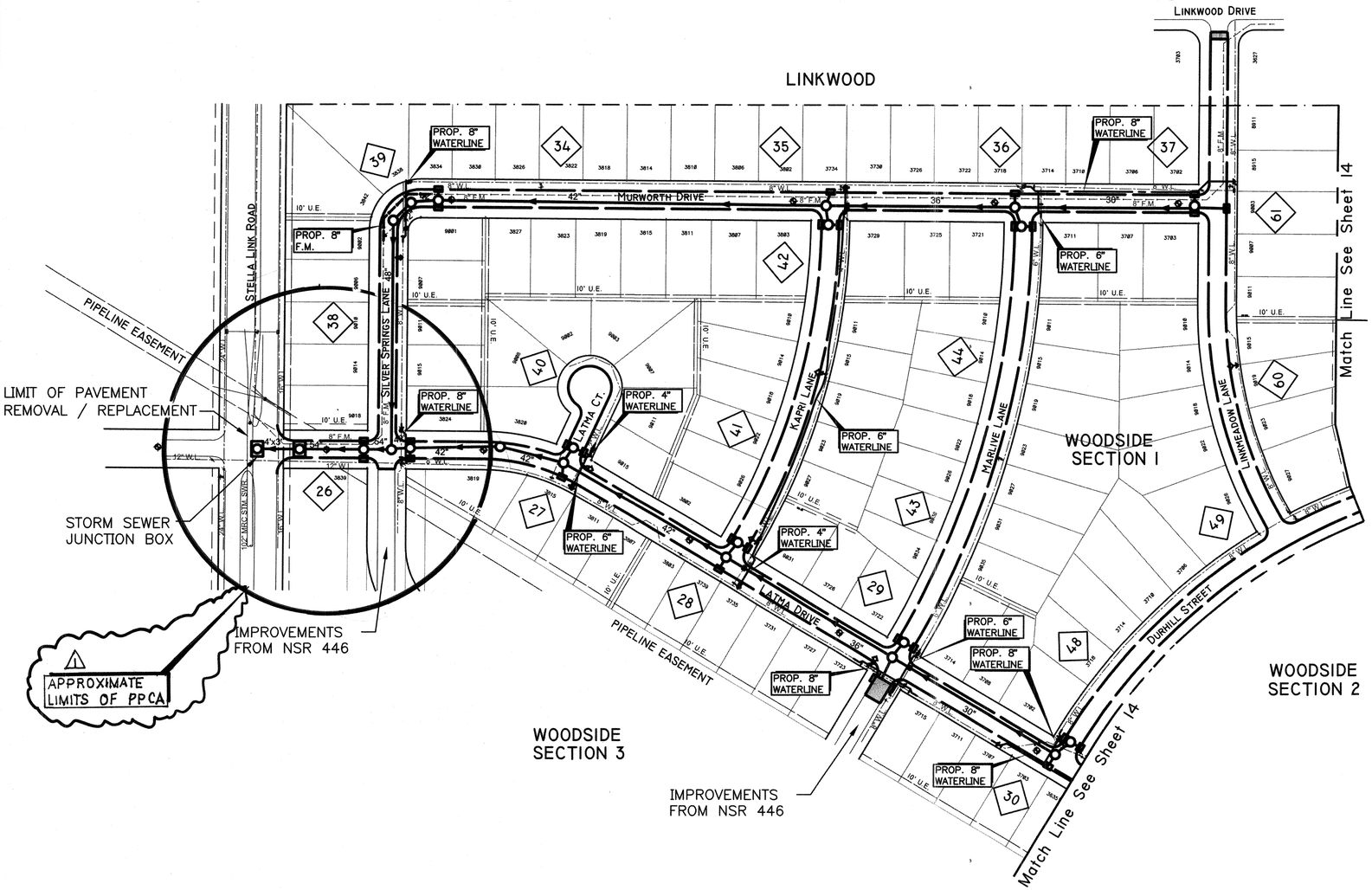
CITY OF HOUSTON PM
MARK BOARD, P.E.

SHEET No: 12 OF 122

FOR CITY OF HOUSTON USE ONLY

PUBLIC WORKS AND ENGINEERING
APPROVED & FILED
48978
NUMBER
CITY SECRETARY
EXAMINED

MP



LEGEND

EXISTING	PROPOSED	
8" W.L.		WATERLINE
		GATE VALVE
		FIRE HYDRANT W/ GATE VALVE
		REDUCER
8" F.M.		FORCE MAIN
	40	SHEET NUMBER
36"	36"	STORM SEWER
		STORM SEWER MANHOLE
		STORM SEWER INLET
		BORE LOCATIONS
		CONCRETE PAVING TRANSITION

NOTE: EXISTING STORM SEWERS TO BE REPLACED ARE NOT SHOWN.

MB

STATE OF TEXAS
HARRY BRIAN WALKER
53225
REGISTERED PROFESSIONAL ENGINEER
1/31/12

1 ADDED PPCA LIMITS 01/31/12 AS DJ

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STATE OF TEXAS
JOHN D. RUDLOFF
83386
LICENSED PROFESSIONAL ENGINEER
10/9/11

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 | Dwn By: F. Redburn
Date: May 2011 | Chkd By: D. Jorgensen

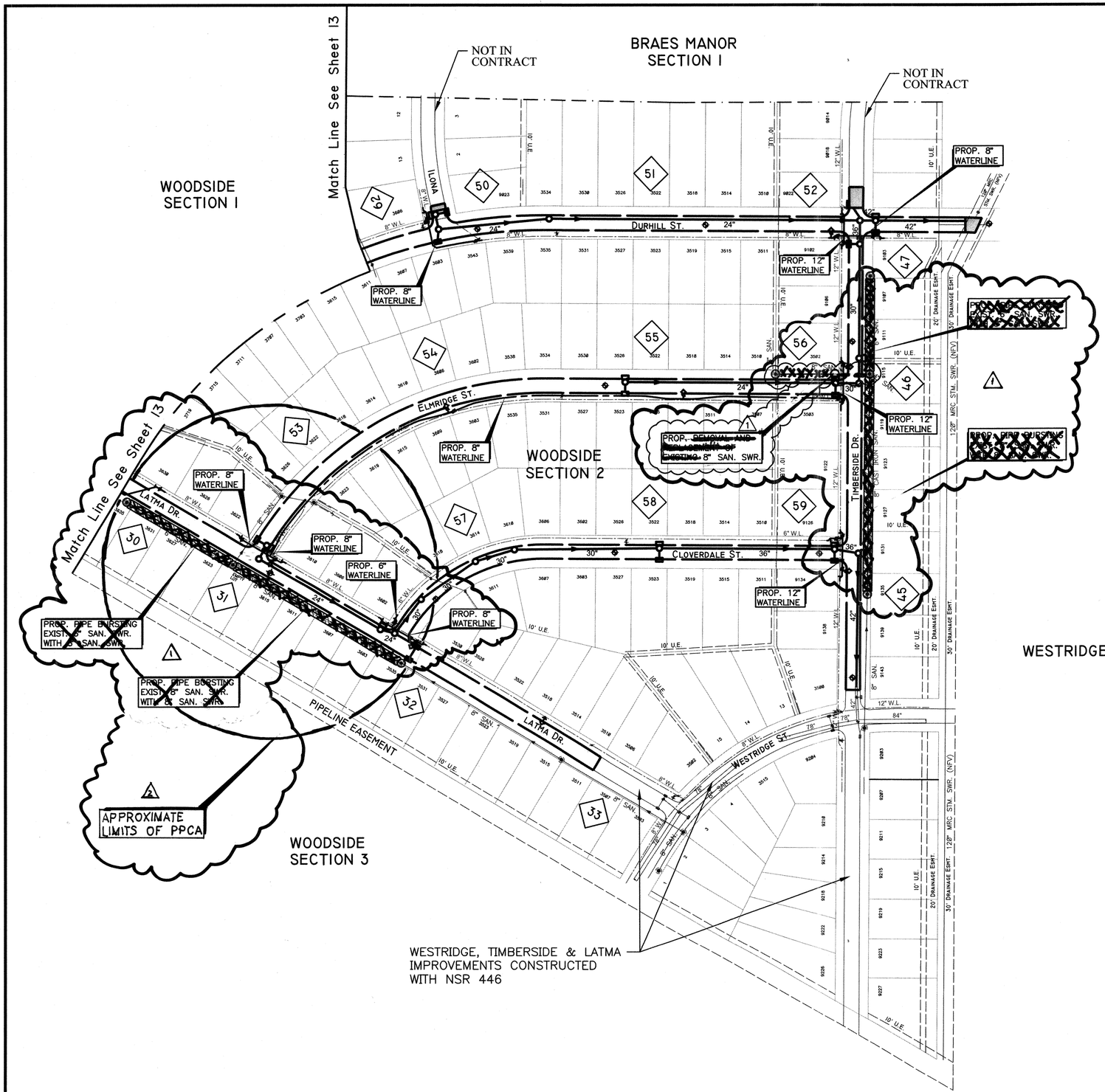
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

West Overall Layout

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	
DRAWING SCALE	
VERT: HORZ: 1"=100'	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	
SHEET No: 13 OF 122	

PUBLIC WORKS AND ENGINEERING
APP'D FILED
48978



2 ADDED PPCA LIMITS 01/31/12 AS HW

1 REVISED SAN. SWR. 12/22/11 AS HW

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STATE OF TEXAS
HARRY BRIAN WALKER
53225
REGISTERED PROFESSIONAL ENGINEER

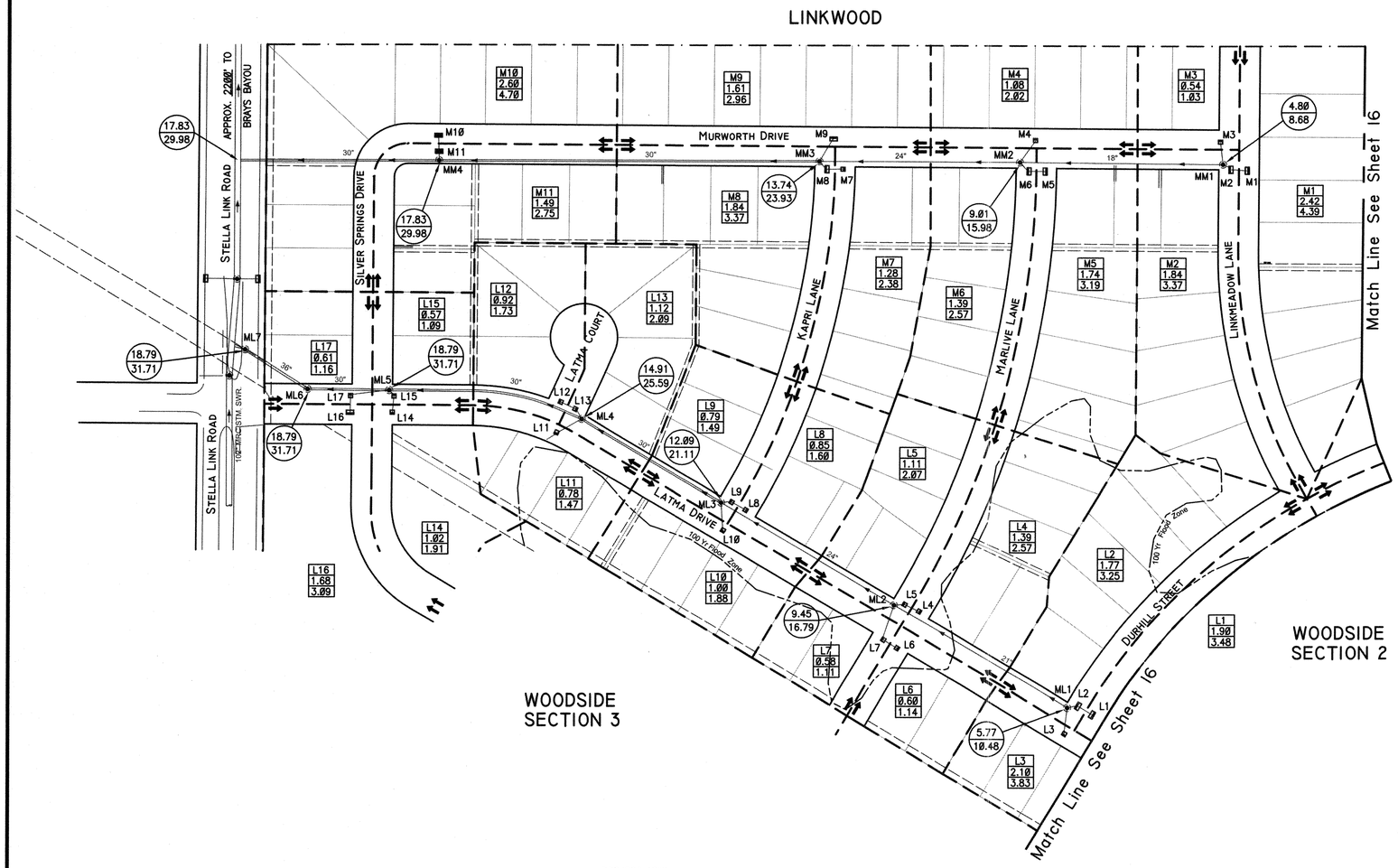
Job No.: 09-051	Dwn By: F. Redburn
Date: May 2011	Chkd By: D. Jorgensen

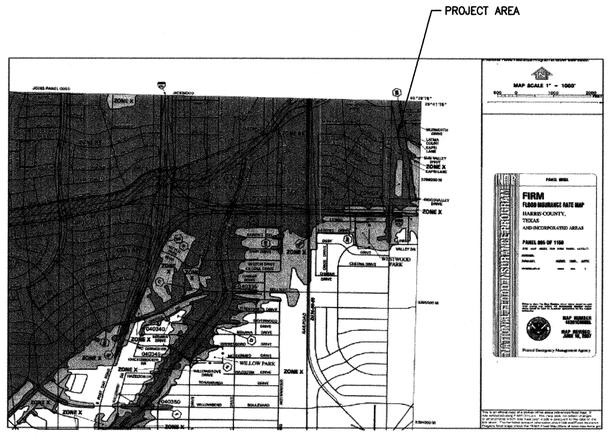
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

East Overall Layout

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	PUBLIC WORKS AND ENGINEERING — EXAMINED AND FILED — 48978 — NUMBER — TEXAS
DRAWING SCALE	
VERT: HORZ:1"=100'	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	
SHEET No: 14 OF 122	





FEMA Flood Map - FIRM Panel 48201C-0865L

SCALE:1"=2000'

TBM'S:

COH SURVEY MARKER 5254 Ø7Ø7 IN YARD OF 3714 LINKWOOD BEHIND CURB EL. 47.14 NAVD 88 (2ØØ1) ADJUSTMENT.

NOTE:

1. ALL ELEVATIONS SHOWN IN HOUSTORM CALCULATIONS ARE IN TSARP DATUM (1988 DATUM, 2ØØ1 ADJ.). SURVEY AND PLAN ELEVATIONS ARE IN NSRS (CORS) DATUM; EQUATION TO TIE FROM NSRS (CORS) DATUM TO TSARP DATUM IS: TSARP EL. (ft) = NSRS EL. (ft) – Ø.21
7. ALL TIME OF CONCENTRATION VALUES ARE CALCULATED FROM THE FOLLOWING FORMULA, PER SECTION 9.Ø5 OF THE COH 2ØØ9 INFRASTRUCTURE DESIGN MANUAL:
   Tc (min) = 1Ø*A^{A-1761} +15
   where A = Drainage Sub-area (Acres)

NOTES:

1. ALL EXISTING STORM LEADS ARE 18" DIAMETER.

LEGEND

- EXISTING DRAINAGE AREA
- FLOW ARROW
- 18" EXISTING STORM SEWER & SIZE
- ML2 EXISTING MANHOLE
- L2 EXISTING INLETS
- ROW IN PROJECT AREA
- 1.2 / 1.87 / 3.42 — DRAINAGE AREA NUMBER; DRAINAGE AREA ACREAGE; DRAINAGE AREA FLOW (c.f.s.) (2 YR. FREQUENCY RAIN FALL EVENT, RUN-OFF COEFFICIENT c=0.55)
- 1.87 / 3.40 — CUMULATIVE DRAINAGE AREA ACREAGE; CUMULATIVE FLOW (c.f.s.) REFLECTS TIME OF CONCENTRATION

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SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

STATE OF TEXAS — JOHN D. RUDLOFF — 83386 — LICENSED PROFESSIONAL ENGINEER — 10/9/11

Job No.: 09-051	Dwn By: F. Redburn
Date: May 2011	Chkd By: D. Jorgensen

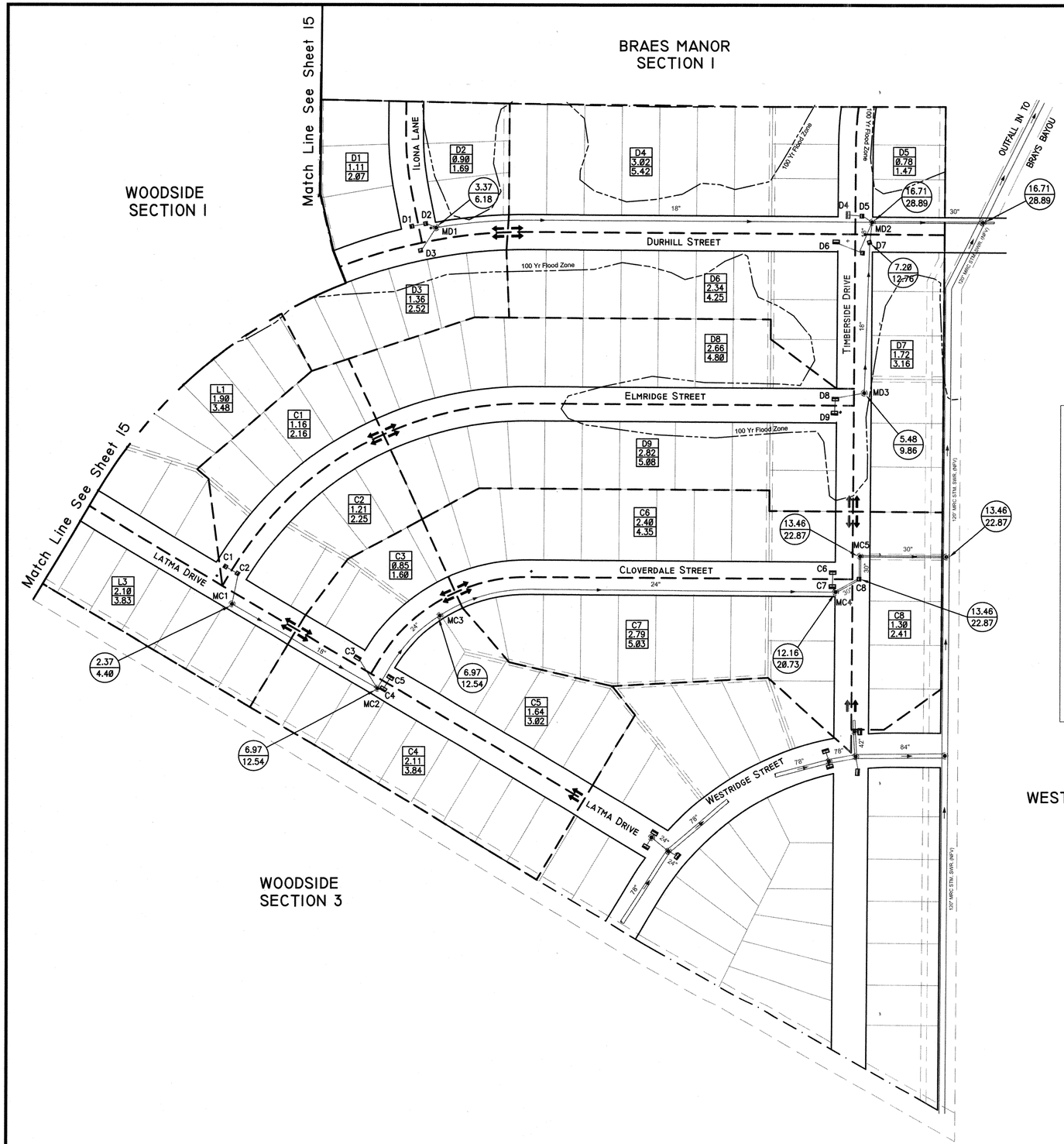
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

West Drainage Area Map
Existing

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	PUBLIC WORKS AND ENGINEERING — APPROVED AND FILED — 48978 — LICENSE NUMBER — TEXAS
DRAWING SCALE	
VERT: HORZ: 1"=100'	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	
SHEET No: 15 OF 122	

MB



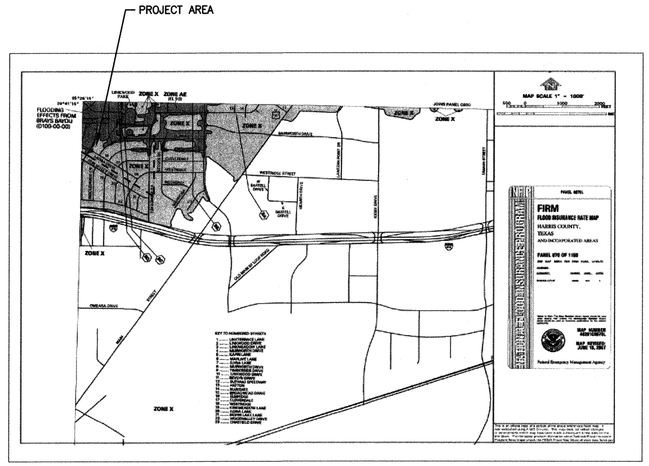
WOODSIDE
SECTION 3

TBM'S:

COH SURVEY MARKER 5254 0707 IN YARD OF 3714 LINKWOOD BEHIND CURB EL. 47.14 NAVD 88 (2001) ADJUSTMENT.

NOTE:

1. ALL ELEVATIONS SHOWN IN HOUSTORM CALCULATIONS ARE IN TSARP DATUM (1988 DATUM, 2001 ADJ.). SURVEY AND PLAN ELEVATIONS ARE IN NSRS (CORS) DATUM; EQUATION TO TIE FROM NSRS (CORS) DATUM TO TSARP DATUM IS:
   TSARP EL. (ft) = NSRS EL. (ft) – 0.21
7. ALL TIME OF CONCENTRATION VALUES ARE CALCULATED FROM THE FOLLOWING FORMULA, PER SECTION 9.05 OF THE COH 2009 INFRASTRUCTURE DESIGN MANUAL:
   $Tc\ (min) = 10*A^{0.1701} + 15$
   where A = Drainage Sub-area (Acres)



FEMA Flood Map - FIRM Panel 48201C-0870L

SCALE:1"=2000'

WESTRIDGE

LEGEND

- EXISTING DRAINAGE AREA
- FLOW ARROW
- EXISTING STORM SEWER & SIZE (18")
- EXISTING MANHOLE (ML2)
- EXISTING INLETS (L2)
- ROW IN PROJECT AREA
- DRAINAGE AREA NUMBER (L2)
- DRAINAGE AREA ACREAGE (1.87)
- DRAINAGE AREA FLOW (c.f.s.) (3.42) (2 YR. FREQUENCY RAIN FALL EVENT, RUN-OFF COEFFICIENT c=0.55)
- CUMULATIVE DRAINAGE AREA ACREAGE (1.87)
- CUMULATIVE FLOW (c.f.s.) REFLECTS TIME OF CONCENTRATION (3.40)

NOTES:

1. ALL EXISTING STORM LEADS ARE 18" DIAMETER.

MB

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STATE OF TEXAS · JOHN D. RUDLOFF · 83386 · LICENSED PROFESSIONAL ENGINEER · 10/9/11

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 | Dwn By: F. Redburn
Date: May 2011 | Chkd By: D. Jorgensen

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

East Drainage Area Map
Existing

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	PUBLIC WORKS AND ENGINEERING · APPROVED AND FILED · 48978 · TEXAS
DRAWING SCALE	
VERT: HORZ: 1"=100'	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	

SHEET No: 16 OF 122

HouStorm (City Of Houston STORM DRAIN DESIGN) Version 2.1, Update:
Nov/01/2007

Run @ 8/23/2010 3:32:14 PM

PROJECT NAME : NSR 446A
JOB NUMBER : 09-051
PROJECT DESCRIPTION : Latma Existing System (2-Year)
PROJECT File: X:\09-051 - Houston - NSR 446a\Design\Design Data\HouStorm\FINAL DESIGN\Existing Systems\Text Files\Latma-2yr.txt

ANALYSYS FREQUENCY : 2 Years
MEASUREMENT UNITS: ENGLISH

OUTPUT FOR ANALYSYS FREQUENCY of: 2 Years

Runoff Computation for Design Frequency.

ID	C Value	Area (acre)	Tc (min)	Tc Used (min)	Intensity (in/hr)	Supply Q (cfs)	Total Q (cfs)
L1	0.55	1.90	26.20	26.20	3.33	0.000	3.476
L2	0.55	1.77	26.06	26.06	3.34	0.000	3.247
L3	0.55	2.10	26.40	26.40	3.31	0.000	3.827
L4	0.55	1.39	25.60	25.60	3.37	0.000	2.573
L5	0.55	1.11	25.19	25.19	3.39	0.000	2.072
L6	0.55	0.60	24.14	24.14	3.47	0.000	1.144
L7	0.55	0.58	24.09	24.09	3.47	0.000	1.107
L8	0.55	0.85	24.72	24.72	3.43	0.000	1.602
L9	0.55	0.79	24.59	24.59	3.44	0.000	1.493
L10	0.55	1.00	25.00	25.00	3.41	0.000	1.874
L11	0.55	0.78	24.57	24.57	3.44	0.000	1.474
L12	0.55	0.92	24.85	24.85	3.42	0.000	1.729
L13	0.55	1.12	25.20	25.20	3.39	0.000	2.090
L14	0.55	1.02	25.03	25.03	3.40	0.000	1.910
L15	0.55	0.57	24.06	24.06	3.47	0.000	1.089
L16	0.55	1.68	25.96	25.96	3.34	0.000	3.088
L17	0.55	0.61	24.17	24.17	3.46	0.000	1.162

Sag Inlets Configuration Data.

Inlet ID	Inlet Type	Length/ Perim (ft)	Grate Area (sf)	Left-Slope Longi (%)	Left-Slope Transv (%)	Right-Slope Longi (%)	Right-Slope Transv (%)	n	Gutter DeprW (ft)	Head Allowed (ft)
L5	Curb	2.50	0.00	0.77	2.00	0.25	2.00	0.014	1.50	0.57
L6	Curb	2.50	0.00	0.77	2.00	0.25	2.00	0.014	1.50	0.57
L7	Curb	2.50	0.00	0.25	2.00	0.77	2.00	0.014	1.50	0.57
L8	Curb	2.50	0.00	0.25	2.00	0.77	2.00	0.014	1.50	0.57
L9	Curb	2.50	0.00	0.77	2.00	0.25	2.00	0.014	1.50	0.57
L10	Curb	2.50	0.00	0.25	2.00	0.25	2.00	0.014	1.50	0.57
L11	Curb	2.50	0.00	0.25	2.00	0.25	2.00	0.014	1.50	0.57
L12	Curb	2.50	0.00	0.77	2.00	0.50	2.00	0.014	1.50	0.57
L13	Curb	2.50	0.00	0.50	2.00	0.77	2.00	0.014	1.50	0.57
L14	Curb	2.50	0.00	0.25	2.00	0.77	2.00	0.014	1.50	0.57
L15	Curb	2.50	0.00	0.77	2.00	0.25	2.00	0.014	1.50	0.57
L16	Curb	2.50	0.00	0.77	2.00	0.25	2.00	0.014	1.50	0.57
L17	Curb	2.50	0.00	0.25	2.00	0.77	2.00	0.014	1.50	0.57
L1	Curb	5.00	0.00	0.25	2.00	0.77	2.00	0.014	1.50	0.57
L2	Curb	5.00	0.00	0.77	2.00	0.25	2.00	0.014	1.50	0.57
L3	Curb	2.50	0.00	0.25	2.00	0.25	2.00	0.014	1.50	0.57
L4	Curb	2.50	0.00	0.25	2.00	0.77	2.00	0.014	1.50	0.57

Sag Inlets Computation Data.

Inlet ID	Inlet Type	Length (ft)	Grate Perim (ft)	Grate Area (sf)	Total Q (cfs)	Inlet Capacity (cfs)	Actual Head (ft)	Ponded Left (ft)	Width Right (ft)
L5	Curb	2.50	n/a	n/a	2.072	3.800	0.345	7.30	9.00
L6	Curb	2.50	n/a	n/a	1.144	3.800	0.279	5.85	7.20
L7	Curb	2.50	n/a	n/a	1.107	3.800	0.277	7.10	5.75
L8	Curb	2.50	n/a	n/a	1.602	3.800	0.307	8.20	6.60
L9	Curb	2.50	n/a	n/a	1.493	3.800	0.299	6.45	7.95
L10	Curb	2.50	n/a	n/a	1.874	3.800	0.328	8.65	8.65
L11	Curb	2.50	n/a	n/a	1.474	3.800	0.298	7.95	7.95
L12	Curb	2.50	n/a	n/a	1.729	3.800	0.316	6.80	7.40
L13	Curb	2.50	n/a	n/a	2.090	3.800	0.347	7.95	7.30
L14	Curb	2.50	n/a	n/a	1.910	3.800	0.331	8.75	7.05
L15	Curb	2.50	n/a	n/a	1.089	3.800	0.276	5.75	7.10
L16	Curb	2.50	n/a	n/a	3.088	3.800	0.461	8.45	10.45
L17	Curb	2.50	n/a	n/a	1.162	3.800	0.280	7.25	5.85
L1	Curb	5.00	n/a	n/a	3.476	7.601	0.317	10.95	8.85
L2	Curb	5.00	n/a	n/a	3.247	7.601	0.308	8.65	10.65
L3	Curb	2.50	n/a	n/a	3.827	3.800	0.574	11.35	11.35
L4	Curb	2.50	n/a	n/a	2.573	3.800	0.397	9.75	7.90

Cumulative Junction Discharge Computations

Node I.D.	Node Type	Weighted C-Value	Cumulat. Dr.Area (acres)	Cumulat. Tc (min)	Intens. (in/hr)	User Supply Q (cfs)	Additional Q in Node (cfs)	Total Disch. (cfs)
L5	Curb	0.550	2.50	25.68	3.36		0.00	4.621
L6	Curb	0.550	0.60	24.14	3.47		0.00	1.144
L7	Curb	0.550	1.18	24.44	3.45		0.00	2.236
L8	Curb	0.550	0.85	24.72	3.43		0.00	1.602
L9	Curb	0.550	1.64	24.81	3.42		0.00	3.085
L10	Curb	0.550	1.00	25.00	3.41		0.00	1.874
L11	Curb	0.550	0.78	24.57	3.44		0.00	1.474
ML1	CrcMh	0.550	5.77	26.57	3.30		0.00	10.481
ML2	CrcMh	0.550	9.45	27.72	3.23		0.00	16.791
ML3	CrcMh	0.550	12.09	28.65	3.17		0.00	21.109
ML4	CrcMh	0.550	14.91	29.59	3.12		0.00	25.588
ML5	CrcMh	0.550	18.79	30.52	3.07		0.00	31.710
ML6	CrcMh	0.550	18.79	30.52	3.07		0.00	31.710
ML7	CrcMh	0.550	18.79	30.52	3.07		0.00	31.710
L12	Curb	0.550	0.92	24.85	3.42		0.00	1.729
L13	Curb	0.550	2.04	25.20	3.39		0.00	3.807
L14	Curb	0.550	1.02	25.03	3.40		0.00	1.910
L15	Curb	0.550	1.59	25.11	3.40		0.00	2.973
L16	Curb	0.550	1.68	25.96	3.34		0.00	3.088
L17	Curb	0.550	2.29	26.16	3.33		0.00	4.193
L1	Curb	0.550	1.90	26.20	3.33		0.00	3.476
L2	Curb	0.550	3.67	26.29	3.32		0.00	6.703
L3	Curb	0.550	2.10	26.40	3.31		0.00	3.827
L4	Curb	0.550	1.39	25.60	3.37		0.00	2.573

OUT	Outlt	0.550	18.79	30.52	3.07		0.00	31.710

Conveyance Configuration Data

Run #	Node US	Node DS	I.D.	FlowLine Elev. US (ft)	FlowLine Elev. DS (ft)	Shape #	Span (ft)	Rise (ft)	Length (ft)	Slope (%)	n_value
1	L1	L2		44.06	43.80	Cir 1	0.00	1.50	27.0	0.963	0.013
2	L2	ML1		43.72	43.68	Cir 1	0.00	1.50	15.0	0.267	0.013
3	L3	ML1		43.87	43.73	Cir 1	0.00	1.50	38.0	0.368	0.013
4	ML1	ML2		43.79	42.70	Cir 1	0.00	1.75	300.0	0.363	0.013
5	L4	L5		44.45	44.00	Cir 1	0.00	1.50	27.0	1.667	0.013
6	L5	ML2		43.81	43.25	Cir 1	0.00	1.50	15.0	3.736	0.013
7	L6	L7		44.28	44.26	Cir 1	0.00	1.50	27.0	0.074	0.013
8	L7	ML2		44.01	42.90	Cir 1	0.00	1.50	52.0	2.135	0.013
9	ML2	ML3		42.64	41.95	Cir 1	0.00	2.00	300.0	0.230	0.013
10	L8	L9		44.21	43.79	Cir 1	0.00	1.50	27.0	1.556	0.013
11	L9	ML3		43.74	42.55	Cir 1	0.00	1.50	15.0	7.958	0.013
12	L10	ML3		43.75	42.69	Cir 1	0.00	1.50	42.0	2.525	0.013
13	ML3	ML4		41.36	40.88	Cir 1	0.00	2.50	242.0	0.198	0.013
14	L11	ML4		43.17	42.13	Cir 1	0.00	1.50	40.0	2.601	0.013
15	L12	L13		42.62	42.05	Cir 1	0.00	1.50	27.0	2.112	0.013
16	L13	ML4		42.00	41.76	Cir 1	0.00	1.50	15.0	1.600	0.013
17	ML4	ML5		40.48	40.19	Cir 1	0.00	2.50	292.0	0.099	0.013
18	L14	L15		43.44	42.93	Cir 1	0.00	1.50	27.0	1.889	0.013
19	L15	ML5		42.68	42.26	Cir 1	0.00	1.50	10.0	4.204	0.013
20	L16	L17		43.46	43.43	Cir 1	0.00	1.50	27.0	0.111	0.013
21	L17	ML5		43.48	42.84	Cir 1	0.00	1.50	56.0	1.143	0.013
22	ML5	ML6		40.11	39.76	Cir 1	0.00	2.50	121.0	0.289	0.013
23	ML6	ML7		39.76	39.51	Cir 1	0.00	3.00	109.0	0.229	0.013
24	ML7	OUT		38.06	38.00	Cir 2	0.00	2.00	15.0	0.400	0.013

Conveyance Hydraulic Computations. Tailwater = 40.470 (ft)

Run #	Hyd. Gr.line US (ft)	Hyd. Gr.line DS (ft)	Crit.Elev US (ft)	Fr.Slope (%)	Depth Unif. (ft)	Depth Actual (ft)	Velocity Unif. (f/s)	Velocity Actual (f/s)	Q (cfs)	Junc Loss Cap (cfs)	Junc Loss (ft)
1*	47.74	47.71	46.70	0.109	0.60	1.50	5.26	4.21	3.5	10.4	0.000
2	47.71	47.65	46.54	0.404	1.50	1.50	3.79	3.79	6.7	5.4	0.000
3	47.74	47.65	46.91	0.132	0.84	1.50	3.77	2.17	3.8	6.4	0.000
4	47.65	46.35	48.38	0.434	1.75	1.75	4.36	4.36	10.5	9.6	0.000
5*	46.39	46.38	46.47	0.060	0.44	1.50	5.90	3.83	2.6	13.6	0.000
6*	46.38	46.35	46.56	0.192	0.49	1.50	9.30	4.64	4.6	20.4	0.000
7	46.39	46.37	46.59	0.012	0.66	1.50	1.52	0.65	1.1	2.9	0.000
8*	46.37	46.35	46.62	0.045	0.39	1.50	6.19	3.68	2.2	15.4	0.000
9	46.35	44.71	47.99	0.546	2.00	2.00	5.34	5.34	18.8	10.9	0.000
10*	44.73	44.72	46.42	0.023	0.35	0.93	5.03	3.31	1.6	13.2	0.000
11*	44.72	44.71	46.57	0.086	0.33	1.50	10.85	4.01	3.1	29.8	0.000
12*	44.72	44.71	46.68	0.032	0.34	1.50	6.25	3.48	1.9	16.8	0.000
13	44.71	44.07	48.15	0.263	2.50	2.50	4.30	4.30	21.1	18.3	0.000
14*	44.08	44.07	46.43	0.020	0.30	1.50	5.88	3.29	1.5	17.0	0.000
15*	44.10	44.09	46.41	0.027	0.34	1.50	5.73	3.41	1.7	15.3	0.000
16*	44.09	44.07	46.22	0.130	0.55	1.50	6.49	4.34	3.8	13.3	0.000
17	44.07	42.95	47.43	0.386	2.50	2.50	5.21	5.21	25.6	13.0	0.000
18*	43.81	43.34	46.41	0.033	0.37	0.41	5.67	4.95	1.9	14.5	0.000
19*	43.34	42.95	46.49	0.079	0.38	0.69	8.56	3.76	3.0	21.6	0.000
20	44.33	44.11	46.73	0.086	1.10	1.10	2.23	2.23	3.1	3.5	0.000
21*	44.11	42.95	46.43	0.158	0.63	0.63	5.89	5.89	4.2	11.3	0.000
22	42.95	42.20	47.33	0.593	2.50	2.50	6.46	6.46	31.7	22.2	0.000
23	42.20	40.54	48.06	0.224	2.44	2.44	5.16	5.16	31.7	32.1	0.000
24	40.54	40.47	47.41	0.487	2.00	2.00	5.05	5.05	31.7	28.7	0.000

* Supercritical flow.

SUMMARY OF STORM DRAIN STRUCTURE QUANTITIES

NOTE:
The convey length should be from upstream to downstream inside box.
This length may also be used as Pay Item.
Using hydraulic length, from node center to node center, may result in profile error,
and this length should not be used as Pay Item.

LINKS:

Type of Convey Structure	Material	Rise (ft)	Span (ft)	Number of Links of this type	Quantity (ft)
Circular	Concrete	1.5	0.0	17	487.0
Circular	Concrete	1.75	0.0	1	300.0
Circular	Concrete	2.0	0.0	2	330.0
Circular	Concrete	2.5	0.0	3	655.0
Circular	Concrete	3.0	0.0	1	109.0

NODES:

Type of Inlet Structure	Type of Grate	Inlet Length (ft)	Grate Width (ft)	Grate Length (ft)	Grate Area (ft)	Grate Perimeter (ft)	Quantity (each)
Curb In Sag		2.5	0.0	0.0	0.0	0.0	15
Circular Manhole		0.0	0.0	0.0	0.0	0.0	7
Curb In Sag		5.0	0.0	0.0	0.0	0.0	2
Outlet		0.0	0.0	0.0	0.0	0.0	1

END

NORMAL TERMINATION OF HOUSTORM.

Warning Messages for current project:

Runoff Frequency of: 2 Years
Discharge decreased downstream node Id= ML6 Previous intensity used.
Discharge decreased downstream node Id= ML7 Previous intensity used.
Decreasing conduit size @ downstream Run# 24
Capacity of sag inlet exceeded at inlet Id= L3
Run# 24 Insufficient capacity.
Run# 22 Insufficient capacity.
Run# 17 Insufficient capacity.
Run# 13 Insufficient capacity.
Run# 9 Insufficient capacity.
Run# 4 Insufficient capacity.
Run# 2 Insufficient capacity.
Upstream HGL exceeds critical elevation (Analysis)at node Id= L2 Run # 2
Upstream HGL exceeds critical elevation (Analysis)at node Id= L3 Run # 3
Upstream HGL exceeds critical elevation (Analysis)at node Id= L1 Run # 1

HouStorm (City Of Houston STORM DRAIN DESIGN) Version 2.1, Update:
Nov/01/2007

Run @ 5/14/2010 12:57:28 PM

PROJECT NAME : NSR 446A
JOB NUMBER : 09-051
PROJECT DESCRIPTION : Murworth Existing System (2-Year)
PROJECT File: X:\09-051 - Houston - NSR 446a\Design\Design Data\HouStorm\FINAL DESIGN\Existing Systems\Text Files\Murworth-2yr.txt

ANALYSYS FREQUENCY : 2 Years
MEASUREMENT UNITS: ENGLISH

OUTPUT FOR ANALYSYS FREQUENCY of: 2 Years

Runoff Computation for Design Frequency.

ID	C Value	Area (acre)	Tc (min)	Tc Used (min)	Intensity (in/hr)	Supply Q (cfs)	Total Q (cfs)
M1	0.55	2.42	26.68	26.68	3.30	0.000	4.386
M2	0.55	1.84	26.13	26.13	3.33	0.000	3.371
M3	0.55	0.54	23.97	23.97	3.48	0.000	1.033
M4	0.55	1.08	25.14	25.14	3.40	0.000	2.018
M5	0.55	1.74	26.03	26.03	3.34	0.000	3.194
M6	0.55	1.39	25.60	25.60	3.37	0.000	2.573
M7	0.55	1.28	25.44	25.44	3.38	0.000	2.377
M8	0.55	1.84	26.13	26.13	3.33	0.000	3.371
M9	0.55	1.61	25.87	25.87	3.35	0.000	2.965
M10	0.55	2.60	26.83	26.83	3.29	0.000	4.699
M11	0.55	1.49	25.73	25.73	3.36	0.000	2.751

Sag Inlets Configuration Data.

Inlet ID	Inlet Type	Length/ Perim (ft)	Grate Area (sf)	Left-Slope Longi (%)	Left-Slope Transv (%)	Right-Slope Longi (%)	Right-Slope Transv (%)	n	Gutter DeprW (ft)	Head Allowed (ft)
M1	Curb	5.00	0.00	0.25	2.00	0.27	2.00	0.014	1.50	0.57
M2	Curb	5.00	0.00	0.27	2.00	0.77	2.00	0.014	1.50	0.57
M3	Curb	2.50	0.00	0.25	2.00	0.77	2.00	0.014	1.50	0.57
M4	Curb	2.50	0.00	0.25	2.00	0.25	2.00	0.014	1.50	0.57
M5	Curb	5.00	0.00	0.77	2.00	0.30	2.00	0.014	1.50	0.57
M6	Curb	5.00	0.00	0.30	2.00	0.77	2.00	0.014	1.50	0.57
M7	Curb	2.50	0.00	0.77	2.00	0.27	2.00	0.014	1.50	0.57
M8	Curb	5.00	0.00	0.27	2.00	0.77	2.00	0.014	1.50	0.57
M9	Curb	5.00	0.00	0.25	2.00	0.25	2.00	0.014	1.50	0.57
M10	Grate	15.00	12.50	0.25	2.00	0.25	2.00	0.014	n/a	0.50
M11	Grate	15.00	12.50	0.25	2.00	0.25	2.00	0.014	n/a	0.50

Sag Inlets Computation Data.

Inlet ID	Inlet Type	Length (ft)	Grate Perim (ft)	Grate Area (sf)	Total Q (cfs)	Inlet Capacity (cfs)	Actual Head (ft)	Ponded Left (ft)	Width Right (ft)
M1	Curb	5.00	n/a	n/a	4.386	7.601	0.357	11.95	11.75
M2	Curb	5.00	n/a	n/a	3.371	7.601	0.313	10.65	8.75
M3	Curb	2.50	n/a	n/a	1.033	3.800	0.274	6.95	5.60
M4	Curb	2.50	n/a	n/a	2.018	3.800	0.340	8.90	8.90
M5	Curb	5.00	n/a	n/a	3.194	7.601	0.307	8.60	10.25
M6	Curb	5.00	n/a	n/a	2.573	7.601	0.287	9.45	7.90
M7	Curb	2.50	n/a	n/a	2.377	3.800	0.375	7.70	9.35
M8	Curb	5.00	n/a	n/a	3.371	7.601	0.313	10.65	8.75
M9	Curb	5.00	n/a	n/a	2.965	7.601	0.299	10.30	10.30
M10	Grate	n/a	15.00	12.50	4.699	16.371	0.218	12.25	12.25
M11	Grate	n/a	15.00	12.50	2.751	16.371	0.152	10.00	10.00

Cumulative Junction Discharge Computations

Node I.D.	Node Type	Weighted C-Value	Cumulat. Dr.Area (acres)	Cumulat. Tc (min)	Intens. (in/hr)	User Supply Q cfs)	Additional Q in Node (cfs)	Total Disch. (cfs)
M1	Curb	0.550	2.42	26.68	3.30		0.00	4.386
M2	Curb	0.550	4.26	26.77	3.29		0.00	7.708
M3	Curb	0.550	0.54	23.97	3.48		0.00	1.033
M4	Curb	0.550	1.08	25.14	3.40		0.00	2.018
M5	Curb	0.550	1.74	26.03	3.34		0.00	3.194
M6	Curb	0.550	3.13	26.10	3.33		0.00	5.737
M7	Curb	0.550	1.28	25.44	3.38		0.00	2.377
M8	Curb	0.550	3.12	26.13	3.33		0.00	5.716
M9	Curb	0.550	1.61	25.87	3.35		0.00	2.965
M10	Grate	0.550	2.60	26.83	3.29		0.00	4.699
M11	Grate	0.550	4.09	26.91	3.28		0.00	7.380
MM1	CrcMh	0.550	4.80	26.80	3.29		0.00	8.680
MM2	CrcMh	0.550	9.01	27.82	3.22		0.00	15.978
MM3	CrcMh	0.550	13.74	28.80	3.17		0.00	23.925
MM4	CrcMh	0.550	17.83	30.73	3.06		0.00	29.980
OUT	Outlt	0.550	17.83	30.73	3.06		0.00	29.980

Conveyance Configuration Data

Run #	Node US	Node DS	I.D.	FlowLine Elev. US (ft)	FlowLine Elev. DS (ft)	Shape #	Span (ft)	Rise (ft)	Length (ft)	Slope (%)	n_value
1	M1	M2		43.56	43.34	Cir 1	0.00	1.50	27.0	0.815	0.013
2	M2	MM1		43.29	43.16	Cir 1	0.00	1.50	12.0	1.083	0.013
3	M3	MM1		43.88	43.16	Cir 1	0.00	1.50	34.0	2.118	0.013
4	MM1	MM2		43.16	42.15	Cir 1	0.00	1.50	302.0	0.334	0.013
5	M4	MM2		43.25	42.15	Cir 1	0.00	1.50	40.0	2.751	0.013
6	M5	M6		42.85	42.38	Cir 1	0.00	1.50	27.0	1.741	0.013
7	M6	MM2		42.38	42.25	Cir 1	0.00	1.50	17.0	0.765	0.013
8	MM2	MM3		41.65	40.71	Cir 1	0.00	2.00	298.0	0.315	0.013
9	M7	M8		41.76	41.40	Cir 1	0.00	1.50	27.0	1.333	0.013
10	M8	MM3		41.30	40.81	Cir 1	0.00	1.50	15.0	3.268	0.013
11	M9	MM3		41.41	40.71	Cir 1	0.00	1.50	40.0	1.750	0.013
12	MM3	MM4		40.41	39.74	Cir 1	0.00	2.50	565.0	0.119	0.013
13	M10	M11		42.49	42.23	Cir 1	0.00	1.50	27.0	0.963	0.013
14	M11	MM4		42.03	41.83	Cir 1	0.00	1.50	15.0	1.333	0.013
15	MM4	OUT		39.74	39.21	Cir 1	0.00	2.50	295.0	0.180	0.013

Conveyance Hydraulic Computations. Tailwater = 41.710 (ft)

Run #	Hyd. Gr.line US (ft)	Hyd. Gr.line DS (ft)	Crit.Elev US (ft)	Fr.Slope (%)	Depth Unif. (ft)	Depth Actual (ft)	Velocity Unif. (f/s)	Velocity Actual (f/s)	Q (cfs)	Junc Loss Cap (cfs)	Junc Loss (ft)
1*	48.81	48.76	46.01	0.173	0.72	1.50	5.26	4.55	4.4	9.5	0.000
2*	48.76	48.70	46.03	0.534	0.93	1.50	6.71	5.68	7.7	11.0	0.000
3*	48.70	48.70	46.44	0.010	0.26	1.50	4.93	2.96	1.0	15.4	0.000
4	48.70	48.65	47.66	0.677	1.50	1.50	4.91	4.91	8.7	6.1	0.000
5*	46.67	46.65	45.95	0.037	0.34	1.50	6.58	3.57	2.0	17.5	0.000
6*	46.73	46.70	45.99	0.092	0.49	1.50	6.37	4.10	3.2	13.9	0.000
7*	46.70	46.65	46.14	0.296	0.86	1.50	5.48	5.02	5.7	9.2	0.000
8	46.65	45.18	47.15	0.495	2.00	2.00	5.09	5.09	16.0	12.8	0.000
9*	45.24	45.22	45.89	0.051	0.45	1.50	5.33	3.73	2.4	12.2	0.000
10*	45.22	45.18	46.05	0.294	0.56	1.50	9.40	5.01	5.7	19.1	0.000
11*	45.21	45.18	45.77	0.079	0.47	1.50	6.25	4.01	3.0	14.0	0.000
12	45.18	43.27	46.71	0.337	2.50	2.50	4.87	4.87	23.9	14.2	0.000
13*	43.40	43.35	46.49	0.198	0.71	1.12	5.70	4.66	4.7	10.4	0.000
14*	43.35	43.27	46.33	0.489	0.84	1.44	7.20	5.57	7.4	12.2	0.000
15	43.27	41.71	47.29	0.530	2.50	2.50	6.11	6.11	30.0	17.5	0.000

* Supercritical flow.

SUMMARY OF STORM DRAIN STRUCTURE QUANTITIES

NOTE:
The convey length should be from upstream to downstream inside box.
This length may also be used as Pay Item.
Using hydraulic length, from node center to node center, may result in profile error,
and this length should not be used as Pay Item.

LINKS:

Type of Convey Structure	Material	Rise (ft)	Span (ft)	Number of Links of this type	Quantity (ft)
Circular	Concrete	1.5	0.0	12	583.0
Circular	Concrete	2.0	0.0	1	298.0
Circular	Concrete	2.5	0.0	2	860.0

NODES:

Type of Inlet Structure	Type of Grate	Inlet Length (ft)	Grate Width (ft)	Grate Length (ft)	Grate Area (ft)	Grate Perimeter (ft)	Quantity (each)
Curb In Sag		5.0	0.0	0.0	0.0	0.0	6
Curb In Sag		2.5	0.0	0.0	0.0	0.0	3
Grate In Sag	Parallel	0.0	0.0	0.0	12.5	15.0	2
Circular Manhole		0.0	0.0	0.0	0.0	0.0	4
Outlet		0.0	0.0	0.0	0.0	0.0	1

END

NORMAL TERMINATION OF HOUSTORM.

Warning Messages for current project:

Runoff Frequency of: 2 Years
Run# 15 Insufficient capacity.
Run# 12 Insufficient capacity.
Run# 8 Insufficient capacity.
Run# 4 Insufficient capacity.
Upstream HGL exceeds critical elevation (Analysis)at node Id= MM1 Run # 4
Up

HouStorm (City Of Houston STORM DRAIN DESIGN) Version 2.1, Update:
Nov/01/2007

Run @ 5/17/2010 2:48:36 PM

PROJECT NAME : NSR 446A
JOB NUMBER : 09-051
PROJECT DESCRIPTION : Durhill Existing System (2-Year)
PROJECT File: X:\09-051 - Houston - NSR 446a\Design\Design Data\HouStorm\FINAL DESIGN\Existing Systems\Text Files\Durhill-2yr.txt

ANALYSYS FREQUENCY : 2 Years
MEASUREMENT UNITS: ENGLISH

OUTPUT FOR ANALYSYS FREQUENCY of: 2 Years

Runoff Computation for Design Frequency.

ID	C Value	Area (acre)	Tc (min)	Tc Used (min)	Intensity (in/hr)	Supply Q (cfs)	Total Q (cfs)
D1	0.55	1.11	25.91	25.91	3.35	0.000	2.042
D2	0.55	0.90	24.82	24.82	3.42	0.000	1.692
D3	0.55	1.36	25.56	25.56	3.37	0.000	2.520
D4	0.55	3.02	27.15	27.15	3.27	0.000	5.424
D6	0.55	2.34	26.61	26.61	3.30	0.000	4.247
D8	0.55	2.66	26.88	26.88	3.28	0.000	4.802
D9	0.55	2.82	27.00	27.00	3.28	0.000	5.080
D7	0.55	1.72	26.00	26.00	3.34	0.000	3.159
D5	0.55	0.78	24.57	24.57	3.44	0.000	1.474

Sag Inlets Configuration Data.

Inlet ID	Inlet Type	Length/ Perim (ft)	Grate Area (sf)	Left-Slope Longi (%)	Left-Slope Transv (%)	Right-Slope Longi (%)	Right-Slope Transv (%)	n	Gutter DepreW (ft)	Head Allowed (ft)
D1	Curb	2.50	0.00	0.77	2.00	0.37	2.00	0.014	1.50	0.57
D2	Curb	2.50	0.00	0.37	2.00	0.77	2.00	0.014	1.50	0.57
D3	Curb	2.50	0.00	0.25	2.00	0.25	2.00	0.014	1.50	0.57
D4	Curb	5.00	0.00	0.77	2.00	0.36	2.00	0.014	1.50	0.57
D6	Curb	5.00	0.00	0.77	2.00	0.28	2.00	0.014	1.50	0.57
D8	Curb	5.00	0.00	0.25	2.00	0.77	2.00	0.014	1.50	0.57
D9	Curb	5.00	0.00	0.25	2.00	0.77	2.00	0.014	1.50	0.57
D7	Curb	2.50	0.00	0.62	2.00	0.77	2.00	0.014	1.50	0.57
D5	Curb	2.50	0.00	0.36	2.00	0.77	2.00	0.014	1.50	0.57

Sag Inlets Computation Data.

Inlet ID	Inlet Type	Length (ft)	Grate Perim (ft)	Grate Area (sf)	Total Q (cfs)	Inlet Capacity (cfs)	Actual Head (ft)	Ponded Left (ft)	Width Right (ft)
D1	Curb	2.50	n/a	n/a	2.042	3.800	0.342	7.25	8.30
D2	Curb	2.50	n/a	n/a	1.692	3.800	0.313	7.75	6.75
D3	Curb	2.50	n/a	n/a	2.520	3.800	0.391	9.70	9.70
D4	Curb	5.00	n/a	n/a	5.424	7.601	0.413	10.45	12.05
D6	Curb	5.00	n/a	n/a	4.247	7.601	0.350	9.55	11.55
D8	Curb	5.00	n/a	n/a	4.802	7.601	0.378	12.35	10.00
D9	Curb	5.00	n/a	n/a	5.080	7.601	0.393	12.60	10.20
D7	Curb	2.50	n/a	n/a	3.159	3.800	0.471	8.90	8.55
D5	Curb	2.50	n/a	n/a	1.474	3.800	0.298	7.40	6.40

Cumulative Junction Discharge Computations

Node I.D.	Node Type	Weighted C-Value	Cumulat. Dr.Area (acres)	Cumulat. Tc (min)	Intens. (in/hr)	User Supply Q cfs)	Additional Q in Node (cfs)	Total Disch. (cfs)
D1	Curb	0.550	1.11	25.91	3.35		0.00	2.042
D2	Curb	0.550	2.01	26.03	3.34		0.00	3.690
D3	Curb	0.550	1.36	25.56	3.37		0.00	2.520
D4	Curb	0.550	3.02	27.15	3.27		0.00	5.424
D6	Curb	0.550	2.34	26.61	3.30		0.00	4.247
D8	Curb	0.550	5.48	27.06	3.27		0.00	9.859
D9	Curb	0.550	2.82	27.00	3.28		0.00	5.080
D7	Curb	0.550	7.20	27.85	3.22		0.00	12.761
D5	Curb	0.550	3.80	27.30	3.26		0.00	6.806
MD1	CrcMh	0.550	3.37	26.08	3.33		0.00	6.179
MD2	CrcMh	0.550	16.71	29.18	3.14		0.00	28.892
MD3	CrcMh	0.550	5.48	27.06	3.27		0.00	9.859
OUT	Outlt	0.550	16.71	29.18	3.14		0.00	28.892

Conveyance Configuration Data

Run #	Node US	I.D. DS	FlowLine Elev. US (ft)	FlowLine Elev. DS (ft)	Shape #	Span (ft)	Rise (ft)	Length (ft)	Slope (%)	n_value
1	D1	D2	44.19	44.03	Cir 1	0.00	1.50	27.0	0.593	0.013
2	D2	MD1	43.98	43.84	Cir 1	0.00	1.50	17.0	0.824	0.013
3	D3	MD1	44.72	43.77	Cir 1	0.00	1.50	48.0	1.980	0.013
4	MD1	MD2	43.64	40.92	Cir 1	0.00	1.50	755.0	0.360	0.013
5	D4	D5	41.30	41.26	Cir 1	0.00	1.50	27.0	0.148	0.013
6	D5	MD2	41.12	41.02	Cir 1	0.00	1.50	20.0	0.500	0.013
7	D6	MD2	42.97	41.07	Cir 1	0.00	1.50	97.0	1.959	0.013
8	D9	D8	43.03	42.55	Cir 1	0.00	1.50	27.0	1.778	0.013
9	D8	MD3	42.38	41.77	Cir 1	0.00	1.50	50.0	1.220	0.013
10	MD3	D7	41.77	41.12	Cir 1	0.00	1.50	263.0	0.247	0.013
11	D7	MD2	41.12	40.97	Cir 1	0.00	1.50	36.0	0.417	0.013
12	MD2	OUT	40.72	40.61	Cir 1	0.00	2.50	192.0	0.057	0.013

Conveyance Hydraulic Computations. Tailwater = 43.110 (ft)

Run #	Hyd. US (ft)	Gr.line DS (ft)	Crit.Elev US (ft)	Fr.Slope (%)	Depth Unif. (ft)	Depth Actual (ft)	Velocity Unif. (f/s)	Velocity Actual (f/s)	Q (cfs)	Cap (cfs)	Junc Loss (ft)
1*	44.88	44.86	46.29	0.037	0.51	0.83	3.81	3.57	2.0	8.1	0.000
2*	44.86	44.84	46.44	0.122	0.65	1.00	5.05	4.29	3.7	9.6	0.000
3*	45.32	44.84	46.96	0.057	0.42	1.07	6.24	1.86	2.5	14.8	0.000
4	44.84	44.05	48.15	0.343	1.20	1.50	4.06	3.50	6.2	6.3	0.000
5	44.14	44.07	45.32	0.264	1.50	1.50	3.07	3.07	5.4	4.1	0.000
6	44.07	44.05	45.46	0.416	1.13	1.50	4.77	3.85	6.8	7.5	0.000

HouStorm (City Of Houston STORM DRAIN DESIGN) Version 2.1, Update:
Nov/01/2007

Run @ 5/14/2010 1:11:50 PM

PROJECT NAME : NSR 446A
JOB NUMBER : 09-051
PROJECT DESCRIPTION : Cloverdale Existing System (2-Year)
PROJECT File: X:\09-051 - Houston - NSR 446a\Design\Design Data\HouStorm\FINAL DESIGN\Existing Systems\Text Files\Cloverdale-2yr.txt

ANALYSYS FREQUENCY : 2 Years
MEASUREMENT UNITS: ENGLISH

OUTPUT FOR ANALYSYS FREQUENCY of: 2 Years

Runoff Computation for Design Frequency.

ID	C Value	Area (acre)	Tc (min)	Tc Used (min)	Intensity (in/hr)	Supply Q (cfs)	Total Q (cfs)
C1	0.55	1.16	25.26	25.26	3.39	0.000	2.162
C2	0.55	1.21	25.34	25.34	3.38	0.000	2.252
C3	0.55	0.85	24.72	24.72	3.43	0.000	1.602
C4	0.55	2.11	26.41	26.41	3.31	0.000	3.844
C5	0.55	1.64	25.91	25.91	3.35	0.000	3.018
C6	0.55	2.40	26.67	26.67	3.30	0.000	4.351
C7	0.55	2.79	26.98	26.98	3.28	0.000	5.027
C8	0.55	1.30	25.47	25.47	3.37	0.000	2.413

Sag Inlets Configuration Data.

Inlet ID	Inlet Type	Length/ Perim (ft)	Grate Area (sf)	Left-Slope Longi (%)	Left-Slope Transv (%)	Right-Slope Longi (%)	Right-Slope Transv (%)	n	Gutter DeprW (ft)	Head Allowed (ft)
C1	Curb	2.50	0.00	0.77	2.00	0.25	2.00	0.014	1.50	0.57
C2	Curb	2.50	0.00	0.25	2.00	0.77	2.00	0.014	1.50	0.57
C3	Curb	5.00	0.00	0.31	2.00	0.77	2.00	0.014	1.50	0.57
C4	Curb	5.00	0.00	0.25	2.00	0.31	2.00	0.014	1.50	0.57
C5	Curb	5.00	0.00	0.77	2.00	0.25	2.00	0.014	1.50	0.57
C6	Curb	5.00	0.00	0.25	2.00	0.77	2.00	0.014	1.50	0.57
C7	Curb	5.00	0.00	0.77	2.00	0.25	2.00	0.014	1.50	0.57
C8	Curb	2.50	0.00	0.25	2.00	0.30	2.00	0.014	1.50	0.57

Sag Inlets Computation Data.

Inlet ID	Inlet Type	Length (ft)	Grate Perim (ft)	Grate Area (sf)	Total Q (cfs)	Inlet Capacity (cfs)	Actual Head (ft)	Ponded Left (ft)	Width Right (ft)
C1	Curb	2.50	n/a	n/a	2.162	3.800	0.354	7.40	9.15
C2	Curb	2.50	n/a	n/a	2.252	3.800	0.362	9.30	7.50
C3	Curb	5.00	n/a	n/a	1.602	7.601	0.264	7.85	6.60
C4	Curb	5.00	n/a	n/a	3.844	7.601	0.332	11.35	10.90
C5	Curb	5.00	n/a	n/a	3.018	7.601	0.300	8.40	10.35
C6	Curb[1]	5.00	n/a	n/a	4.351	7.601	0.355	11.90	9.65
C7	Curb	5.00	n/a	n/a	5.027	7.601	0.390	10.15	12.55
C8	Curb	2.50	n/a	n/a	2.413	3.800	0.379	9.55	9.20

Cumulative Junction Discharge Computations

Node I.D.	Node Type	Weighted C-Value	Cumulat. Dr.Area (acres)	Cumulat. Tc (min)	Intens. (in/hr)	User Supply Q cfs)	Additional Q in Node (cfs)	Total Disch. (cfs)
C1	Curb	0.550	1.16	25.26	3.39		0.00	2.162
C2	Curb	0.550	2.37	25.43	3.38		0.00	4.403
C3	Curb	0.550	0.85	24.72	3.43		0.00	1.602
C4	Curb	0.550	3.75	26.41	3.31		0.00	6.832
C5	Curb	0.550	1.64	25.91	3.35		0.00	3.018
C6	Curb	0.550	2.40	26.67	3.30		0.00	4.351
C7	Curb	0.550	5.19	26.98	3.28		0.00	9.352
C8	Curb	0.550	13.46	30.14	3.09		0.00	22.872
MC1	CrcMh	0.550	2.37	25.43	3.38		0.00	4.403
MC2	CrcMh	0.550	6.97	27.06	3.27		0.00	12.541
MC3	CrcMh	0.550	6.97	27.06	3.27		0.00	12.541
MC4	CrcMh	0.550	12.16	29.96	3.10		0.00	20.730
MC5	CrcMh	0.550	13.46	30.14	3.09		0.00	22.872
OUT	Outlt	0.550	13.46	30.14	3.09		0.00	22.872

Conveyance Configuration Data

Run #	Node US	I.D. DS	FlowLine Elev. US (ft)	FlowLine Elev. DS (ft)	Shape #	Span (ft)	Rise (ft)	Length (ft)	Slope (%)	n_value
1	C1	C2	45.28	45.22	Cir 1	0.00	1.50	27.0	0.222	0.013
2	C2	MC1	45.08	44.91	Cir 1	0.00	1.50	52.0	0.327	0.013
3	MC1	MC2	44.76	44.19	Cir 1	0.00	1.50	292.0	0.195	0.013
4	C3	MC2	44.72	44.02	Cir 1	0.00	1.50	64.0	1.094	0.013
5	C5	C4	44.23	44.13	Cir 1	0.00	1.50	27.0	0.370	0.013
6	C4	MC2	44.13	44.11	Cir 1	0.00	1.50	8.0	0.250	0.013
7	MC2	MC3	44.12	43.75	Cir 1	0.00	2.00	170.0	0.218	0.013
8	MC3	MC4	43.70	41.97	Cir 1	0.00	2.00	695.0	0.249	0.013
9	C6	C7	43.36	42.99	Cir 1	0.00	1.50	27.0	1.370	0.013
10	C7	MC4	42.72	41.97	Cir 1	0.00	1.50	10.0	7.521	0.013
11	MC4	C8	41.78	41.77	Cir 1	0.00	2.50	46.0	0.022	0.013
12	C8	MC5	41.69	41.67	Cir 1	0.00	2.50	39.0	0.051	0.013
13	MC5	OUT	41.67	41.43	Cir 1	0.00	2.50	145.0	0.166	0.013

Conveyance Hydraulic Computations. Tailwater = 43.930 (ft)

Run #	Hyd. US (ft)	Gr.line DS (ft)	Crit.Elev US (ft)	Fr.Slope (%)	Depth Unif. (ft)	Depth Actual (ft)	Velocity Unif. (f/s)	Velocity Actual (f/s)	Q (cfs)	Cap (cfs)	Junc Loss (ft)
1	47.44	47.39	47.56	0.042	0.69	1.50	2.71	1.22	2.2	5.0	0.000
2	47.39	47.31	47.59	0.174	0.95	1.50	3.71	2.49	4.4	6.0	0.000
3	47.31	47.25	48.97	0.174	1.17	1.50	2.99	2.49	4.4	4.7	0.000
4*	47.26	47.25	47.82	0.023	0.39	1.50	4.43	3.31	1.6	11.0	0.000
5	47.36	47.28	47.49	0.082	0.73	1.50	3.57	1.71	3.0	6.4	0.000
6	47.28	47.25	47.50	0.419	1.50	1.50	3.87	3.87	6.8	5.3	0.000
7	47.25	46.73	48.91	0.305	2.00	2.00	3.99	3.99	12.5	10.6	0.000
8	46.73	44.61	49.70	0.305	2.00	2.00	3.99	3.99	12.5	11.3	0.000
9*	44.74	44.69	46.51	0.170	0.62	1.50	6.36	4.54	4.4	12.3	0.000
10*	44.69	44.61	46.48	0.786	0.59	1.50	14.56	6.26	9.4	28.9	0.000
11	44.61	44.50	47.42	0.253	2.50	2.50	4.22	4.22	20.7	6.1	0.000
12	44.50	44.38	46.68	0.308	2.50	2.50	4.66	4.66	22.9	9.3	0.000
13	44.38	43.93	47.42	0.308	2.50	2.50	4.66	4.66	22.9	16.8	0.000

* Supercritical flow.

SUMMARY OF STORM DRAIN STRUCTURE QUANTITIES

NOTE:
The convey length should be from upstream to downstream inside box. This length may also be used as Pay Item. Using hydraulic length, from node center to node center, may result in profile error, and this length should not be used as Pay Item.

LINKS:

Type of Convey Structure	Material	Rise (ft)	Span (ft)	Number of Links of this type	Quantity (ft)
Circular	Concrete	1.5	0.0	8	507.0
Circular	Concrete	2.0	0.0	2	865.0
Circular	Concrete	2.5	0.0	3	230.0

NODES:

Type of Inlet Structure	Type of Grate	Inlet Length (ft)	Grate Width (ft)	Grate Length (ft)	Grate Area (ft)	Grate Perimeter (ft)	Quantity (each)
Curb In Sag		2.5	0.0	0.0	0.0	0.0	3
Curb In Sag		5.0	0.0	0.0	0.0	0.0	5
Circular Manhole		0.0	0.0	0.0	0.0	0.0	5
Outlet		0.0	0.0	0.0	0.0	0.0	1

END

NORMAL TERMINATION OF HOUSTORM.

Warning Messages for current project:

Runoff Frequency of: 2 Years
Discharge decreased downstream node Id= MC1 Previous intensity used.
Discharge decreased downstream node Id= MC3 Previous intensity used.
Discharge decreased downstream node Id= MC5 Previous intensity used.
Run# 13 Insufficient capacity.
Run# 12 Insufficient capacity.
Run# 11 Insufficient capacity.
Run# 8 Insufficient capacity.
Run# 7 Insufficient capacity.
Run# 6 Insufficient capacity.

MB

NOTES:

1. ALL ELEVATIONS SHOWN IN HOUSTORM CALCULATIONS ARE IN TSARP DATUM. SURVEY AND PLAN ELEVATIONS ARE IN NSRS (CORS) DATUM; EQUATION TO TIE FROM NSRS (CORS) DATUM TO TSARP DATUM IS:
   TSARP EL. (ft) = NSRS EL. (ft) − 0.21
2. ALL TIME OF CONCENTRATION VALUES ARE CALCULATED FROM THE FOLLOWING FORMULA, PER SECTION 9.05 OF THE COH 2009 INFRASTRUCTURE DESIGN MANUAL:
   $Tc\ (min) = 10 w_{AVG}^{0.17} + 15$
   where A = Drainage Sub-area (Acres)
3. STARTING TAILWATER FOR 2-YR EVENT SHALL BE TOP OF PIPE AT INTERCONNECT, PER SECTION D, PART (2) OF CIP STORM DESIGN CONSIDERATIONS.
   TOP OF 36" RCP (DURHILL) = 43.11
   TOP OF 36" RCP (CLOVERDALE) = 43.93

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SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

STATE OF TEXAS · JOHN D. RUDLOFF · 83386 · LICENSED PROFESSIONAL ENGINEER
10/9/11

Job No.: 09-051 Dwn By: P. Hopkins
Date: May 2011 Chkd By: D. Jorgensen

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

HouStorm Drainage Calcs.
Existing 2-Year

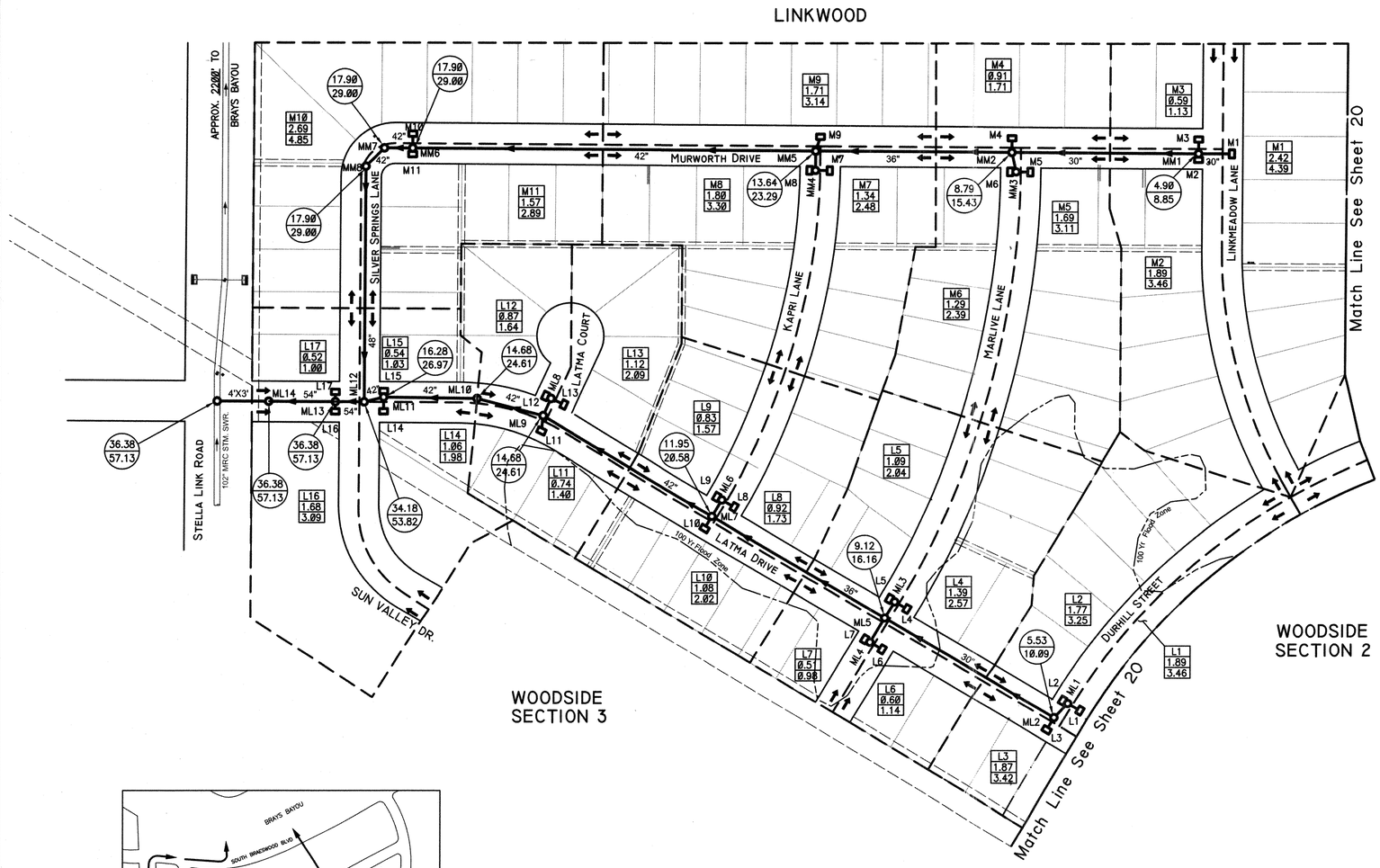
WBS NO.
N-000378-0002-4

DRAWING SCALE
VERT: HORZ:

CITY OF HOUSTON PM
MARK BOARD, P.E.

FOR CITY OF HOUSTON USE ONLY
PUBLIC WORKS AND ENGINEERING · REVIEWED AND FILED · 48978 · NUMBER · TEXAS

SHEET No: 18 OF 122



TBM'S:

COH SURVEY MARKER 5254 0707 IN YARD OF 3714 LINKWOOD BEHIND CURB EL. 47.14 NAVD 88 (2001) ADJUSTMENT.

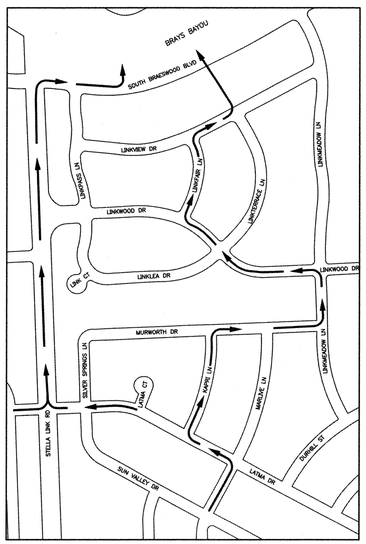
NOTE:

1. ALL ELEVATIONS SHOWN IN HOUSTORM CALCULATIONS ARE IN TSARP DATUM (1988 DATUM, 2001 ADJ.). SURVEY AND PLAN ELEVATIONS ARE IN NSRS (CORS) DATUM; EQUATION TO TIE FROM NSRS (CORS) DATUM TO TSARP DATUM IS:
   TSARP EL. (ft) = NSRS EL. (ft) – 0.21

7. ALL TIME OF CONCENTRATION VALUES ARE CALCULATED FROM THE FOLLOWING FORMULA, PER SECTION 9.05 OF THE COH 2009 INFRASTRUCTURE DESIGN MANUAL:
   Tc (min) = $10*A^{0.1781}$ +15
   where A = Drainage Sub-area (Acres)

NOTES:

1. ALL PROPOSED STORM LEADS ARE 24" DIAMETER MINIMUM.

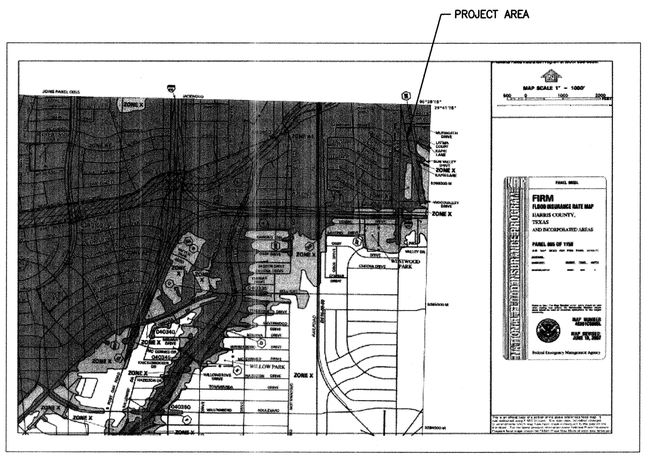


Extreme Event Overland Flow Path

SCALE:1"=400'

Legend

Direction of Overland Flow



FEMA Flood Map - FIRM Panel 48201C-0865L

SCALE:1"=2000'

LEGEND

- DRAINAGE AREA
- FLOW ARROW
- 18" EXISTING STORM SEWER & SIZE (STORM SEWERS TO REMAIN ONLY)
- 24" PROPOSED STORM SEWER & SIZE
- EXISTING MANHOLE (REMAINING ONLY)
- EXISTING INLETS (REMAINING ONLY)
- ML2 PROPOSED MANHOLE OR JUNCTION BOX
- L2 PROPOSED INLET
- ROW IN PROJECT AREA
- L2 / 1.87 / 3.42 — DRAINAGE AREA NUMBER; DRAINAGE AREA ACREAGE; DRAINAGE AREA FLOW (c.f.s.) (2 YR. FREQUENCY RAIN FALL EVENT, RUN-OFF COEFFICIENT c=0.55)
- 1.87 / 3.40 — CUMULATIVE DRAINAGE AREA ACREAGE; CUMULATIVE FLOW (c.f.s.) REFLECTS TIME OF CONCENTRATION

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STATE OF TEXAS — JOHN D. RUDLOFF — 83386 — LICENSED PROFESSIONAL ENGINEER — 10/19/11

SURVEYED BY: Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 | Dwn By: F. Redburn
Date: May 2011 | Chkd By: D. Jorgensen

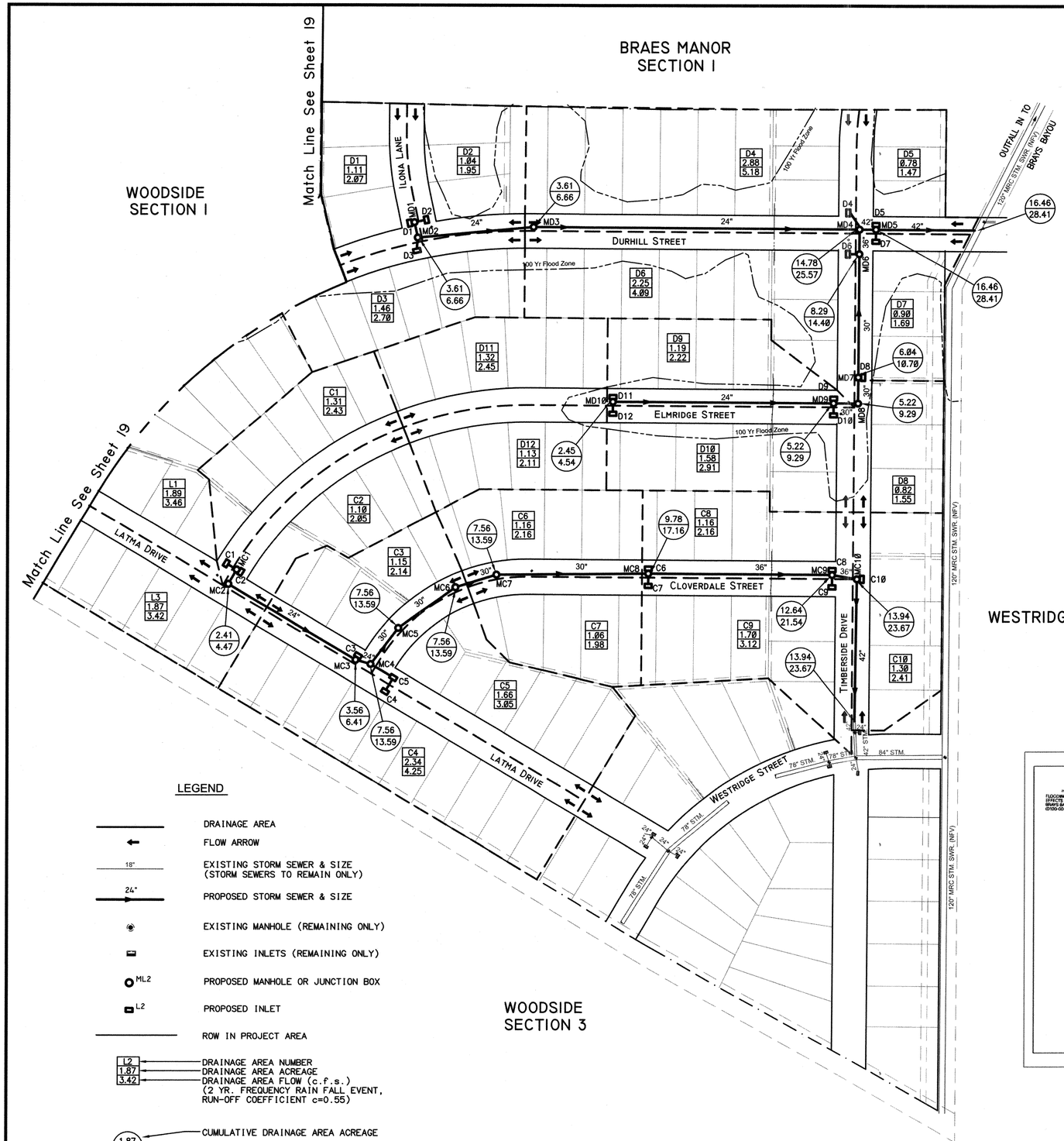
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

West Drainage Area Map
Proposed

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	PUBLIC WORKS AND ENGINEERING — 48978 — TEXAS
DRAWING SCALE	
VERT: HORZ: 1"=100'	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	
SHEET No: 19 OF 122	

MB



LEGEND

- DRAINAGE AREA
- FLOW ARROW
- 18" EXISTING STORM SEWER & SIZE (STORM SEWERS TO REMAIN ONLY)
- 24" PROPOSED STORM SEWER & SIZE
- EXISTING MANHOLE (REMAINING ONLY)
- EXISTING INLETS (REMAINING ONLY)
- ML2 PROPOSED MANHOLE OR JUNCTION BOX
- L2 PROPOSED INLET
- ROW IN PROJECT AREA

L2 — DRAINAGE AREA NUMBER
1.87 — DRAINAGE AREA ACREAGE
3.42 — DRAINAGE AREA FLOW (c.f.s.) (2 YR. FREQUENCY RAIN FALL EVENT, RUN-OFF COEFFICIENT c=0.55)

1.87 — CUMULATIVE DRAINAGE AREA ACREAGE
3.40 — CUMULATIVE FLOW (c.f.s.) REFLECTS TIME OF CONCENTRATION

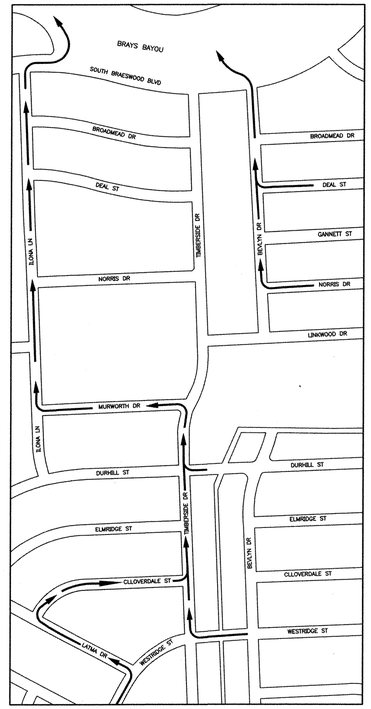
WOODSIDE
SECTION 3

TBM'S:

COH SURVEY MARKER 5254 Ø7Ø7 IN YARD OF 3714 LINKWOOD BEHIND CURB EL. 47.14 NAVD 88 (2Ø Ø1) ADJUSTMENT.

NOTE:

1. ALL ELEVATIONS SHOWN IN HOUSTORM CALCULATIONS ARE IN TSARP DATUM (1988 DATUM, 2Ø Ø1 ADJ.). SURVEY AND PLAN ELEVATIONS ARE IN NSRS (CORS) DATUM; EQUATION TO TIE FROM NSRS (CORS) DATUM TO TSARP DATUM IS: TSARP EL. (ft) = NSRS EL. (ft) – Ø.21
7. ALL TIME OF CONCENTRATION VALUES ARE CALCULATED FROM THE FOLLOWING FORMULA, PER SECTION 9.Ø5 OF THE COH 2Ø Ø9 INFRASTRUCTURE DESIGN MANUAL: Tc (min) = $1Ø*A^{0.1761}$ +15 where A = Drainage Sub-area (Acres)

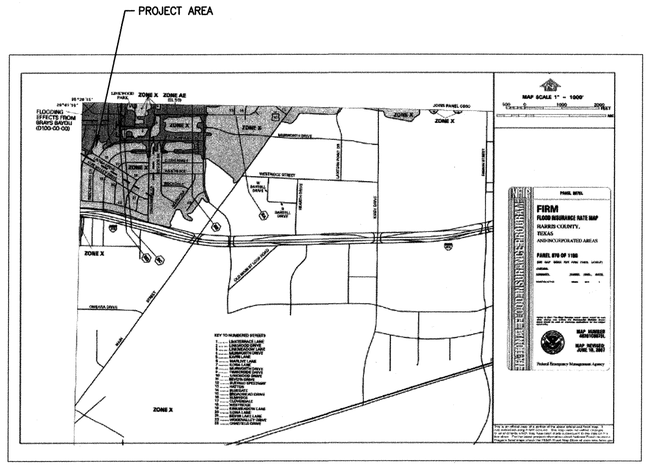


Legend

Direction of Overland Flow

Extreme Event Overland Flow Path

SCALE:1"=400'



FEMA Flood Map - FIRM Panel 48201C-0870L

SCALE:1"=2000'

NOTES:

1. ALL PROPOSED STORM LEADS ARE 24" DIAMETER MINIMUM.

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SURVEYED BY:
Landtech Consultants, Inc.
FB NO. FB#5543

STATE OF TEXAS — JOHN D. RUDLOFF — 83386 — LICENSED PROFESSIONAL ENGINEER — 10/19/11

Job No.: 09-051	Dwn By: F. Redburn
Date: May 2011	Chkd By: D. Jorgensen

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

East Drainage Area Map
Proposed

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	PUBLIC WORKS AND ENGINEERING — FILED — 48978 — NUMBER — TEXAS
DRAWING SCALE	
VERT: HORZ: 1"=100'	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	
SHEET No: 20 OF 122	

MB

HouStorm (City Of Houston STORM DRAIN DESIGN) Version 2.1, Update: Nov/01/2007

Run @ 8/23/2010 2:16:52 PM

PROJECT NAME : NSR 446A
JOB NUMBER : 09-051
PROJECT DESCRIPTION : Latma-Murworth Proposed System (2-Year)
PROJECT File: X:\09-051 - Houston - NSR 446a\Design\Design Data\HouStorm\FINAL DESIGN\Proposed Systems\2-Year\Text Files\Latma-Murworth-2yr.txt

ANALYSYS FREQUENCY : 2 Years
MEASUREMENT UNITS: ENGLISH

OUTPUT FOR ANALYSYS FREQUENCY of: 2 Years

Runoff Computation for Design Frequency.

ID	C Value	Area (acre)	Tc (min)	Tc Used (min)	Intensity (in/hr)	Supply Q (cfs)	Total Q (cfs)
L1	0.55	1.89	26.19	26.19	3.33	0.000	3.458
L2	0.55	1.77	26.06	26.06	3.34	0.000	3.247
L3	0.55	1.87	26.17	26.17	3.33	0.000	3.423
L4	0.55	1.39	25.60	25.60	3.37	0.000	2.573
L5	0.55	1.09	25.15	25.15	3.40	0.000	2.036
L6	0.55	0.60	24.14	24.14	3.47	0.000	1.144
L7	0.55	0.51	23.88	23.88	3.49	0.000	0.978
L8	0.55	0.92	24.85	24.85	3.42	0.000	1.729
L9	0.55	0.83	24.68	24.68	3.43	0.000	1.565
L10	0.55	1.08	25.14	25.14	3.40	0.000	2.018
L11	0.55	0.74	24.48	24.48	3.44	0.000	1.401
L12	0.55	0.87	24.76	24.76	3.42	0.000	1.638
L13	0.55	1.12	25.20	25.20	3.39	0.000	2.090
L14	0.55	1.06	25.10	25.10	3.40	0.000	1.982
L15	0.55	0.54	23.97	23.97	3.48	0.000	1.033
L16	0.55	1.68	25.96	25.96	3.34	0.000	3.088
L17	0.55	0.52	23.91	23.91	3.48	0.000	0.996
M10	0.55	2.69	26.90	26.90	3.28	0.000	4.855
M11	0.55	1.57	25.83	25.83	3.35	0.000	2.893
M1	0.55	2.42	26.68	26.68	3.30	0.000	4.386
M2	0.55	1.89	26.19	26.19	3.33	0.000	3.458
M3	0.55	0.59	24.11	24.11	3.47	0.000	1.126
M4	0.55	0.91	24.84	24.84	3.42	0.000	1.711
M5	0.55	1.69	25.97	25.97	3.34	0.000	3.106
M6	0.55	1.29	25.46	25.46	3.38	0.000	2.395
M7	0.55	1.34	25.53	25.53	3.37	0.000	2.484
M8	0.55	1.80	26.09	26.09	3.33	0.000	3.300
M9	0.55	1.71	25.99	25.99	3.34	0.000	3.141

Sag Inlets Configuration Data.

Inlet ID	Inlet Type	Length/ Perim (ft)	Grate Area (sf)	Left-Slope Longi (%)	Left-Slope Transv (%)	Right-Slope Longi (%)	Right-Slope Transv (%)	Gutter n	Gutter Deprw (ft)	Head Allowed (ft)
L1	Curb	5.00	0.00	0.30	2.00	1.58	2.00	0.014	1.50	0.57
L2	Curb	5.00	0.00	1.16	2.00	0.30	2.00	0.014	1.50	0.57
L3	Curb	5.00	0.00	0.50	2.00	0.50	2.00	0.014	1.50	0.57
L4	Curb	5.00	0.00	0.30	2.00	1.39	2.00	0.014	1.50	0.57
L5	Curb	5.00	0.00	1.39	2.00	0.30	2.00	0.014	1.50	0.57
L6	Curb	5.00	0.00	1.16	2.00	1.50	2.00	0.014	1.50	0.57
L7	Curb	5.00	0.00	1.34	2.00	1.16	2.00	0.014	1.50	0.57
L8	Curb	5.00	0.00	0.30	2.00	1.77	2.00	0.014	1.50	0.57
L9	Curb	5.00	0.00	0.50	2.00	0.50	2.00	0.014	1.50	0.57
L10	Curb	5.00	0.00	0.50	2.00	0.50	2.00	0.014	1.50	0.57
L11	Curb	5.00	0.00	0.35	2.00	0.30	2.00	0.014	1.50	0.57
L12	Curb	5.00	0.00	1.54	2.00	0.30	2.00	0.014	1.50	0.57
L13	Curb	5.00	0.00	0.31	2.00	1.54	2.00	0.014	1.50	0.57
L14	Curb	5.00	0.00	0.39	2.00	1.85	2.00	0.014	1.50	0.57
L15	Curb	5.00	0.00	1.16	2.00	0.39	2.00	0.014	1.50	0.57
L16	Curb	5.00	0.00	2.74	2.00	0.30	2.00	0.014	1.50	0.57
L17	Curb	5.00	0.00	0.30	2.00	1.16	2.00	0.014	1.50	0.57
M1	Curb	5.00	0.00	0.35	2.00	0.30	2.00	0.014	1.50	0.57
M2	Curb	5.00	0.00	1.58	2.00	0.44	2.00	0.014	1.50	0.57
M3	Curb	5.00	0.00	0.44	2.00	2.43	2.00	0.014	1.50	0.57
M4	Curb	5.00	0.00	0.34	2.00	0.30	2.00	0.014	1.50	0.57
M5	Curb	5.00	0.00	1.43	2.00	0.44	2.00	0.014	1.50	0.57
M6	Curb	5.00	0.00	0.44	2.00	1.16	2.00	0.014	1.50	0.57
M7	Curb	5.00	0.00	1.20	2.00	0.43	2.00	0.014	1.50	0.57
M8	Curb	5.00	0.00	0.43	2.00	1.16	2.00	0.014	1.50	0.57
M9	Curb	5.00	0.00	0.30	2.00	0.34	2.00	0.014	1.50	0.57
M10	Curb	5.00	0.00	0.30	2.00	0.31	2.00	0.014	1.50	0.57
M11	Curb	5.00	0.00	0.31	2.00	0.30	2.00	0.014	1.50	0.57

Sag Inlets Computation Data.

Inlet ID	Inlet Type	Length (ft)	Grate Perim (ft)	Grate Area (sf)	Total Q (cfs)	Inlet Capacity (cfs)	Actual Head (ft)	Ponded Left (ft)	Width Right (ft)
L1	Curb	5.00	n/a	n/a	3.458	7.601	0.316	10.55	7.70
L2	Curb	5.00	n/a	n/a	3.247	7.601	0.308	8.00	10.30
L3	Curb	5.00	n/a	n/a	3.423	7.601	0.315	9.55	9.55
L4	Curb	5.00	n/a	n/a	2.573	7.601	0.287	9.45	7.10
L5	Curb	5.00	n/a	n/a	2.036	7.601	0.273	6.50	8.65
L6	Curb	5.00	n/a	n/a	1.144	7.601	0.257	5.40	5.15
L7	Curb	5.00	n/a	n/a	0.978	7.601	0.255	4.95	5.10
L8	Curb	5.00	n/a	n/a	1.729	7.601	0.267	8.15	5.85
L9	Curb	5.00	n/a	n/a	1.565	7.601	0.264	7.10	7.10
L10	Curb	5.00	n/a	n/a	2.018	7.601	0.273	7.85	7.85
L11	Curb	5.00	n/a	n/a	1.401	7.601	0.261	7.30	7.50
L12	Curb	5.00	n/a	n/a	1.638	7.601	0.265	5.85	7.95
L13	Curb	5.00	n/a	n/a	2.090	7.601	0.274	8.70	6.40
L14	Curb	5.00	n/a	n/a	1.982	7.601	0.272	8.15	6.10
L15	Curb	5.00	n/a	n/a	1.033	7.601	0.256	5.20	6.40
L16	Curb	5.00	n/a	n/a	3.088	7.601	0.303	6.65	10.10
L17	Curb	5.00	n/a	n/a	0.996	7.601	0.255	6.60	5.15
M1	Curb	5.00	n/a	n/a	4.386	7.601	0.357	11.20	11.55
M2	Curb	5.00	n/a	n/a	3.458	7.601	0.316	7.70	9.85
M3	Curb	5.00	n/a	n/a	1.126	7.601	0.257	6.45	4.65
M4	Curb	5.00	n/a	n/a	1.711	7.601	0.266	7.95	8.10
M5	Curb	5.00	n/a	n/a	3.106	7.601	0.303	7.55	9.45
M6	Curb	5.00	n/a	n/a	2.395	7.601	0.282	8.55	7.15
M7	Curb	5.00	n/a	n/a	2.484	7.601	0.284	7.20	8.70
M8	Curb	5.00	n/a	n/a	3.300	7.601	0.310	9.70	8.05
M9	Curb	5.00	n/a	n/a	3.141	7.601	0.305	10.20	9.95
M10	Curb	5.00	n/a	n/a	4.855	7.601	0.381	12.00	11.90
M11	Curb	5.00	n/a	n/a	2.893	7.601	0.296	9.80	9.85

Cumulative Junction Discharge Computations

Node I.D.	Node Type	Weighted C-Value	Cumulat. Dr.Area (acres)	Cumulat. Tc (min)	Intens. (in/hr)	User Supply Q cfs)	Additional Q in Node (cfs)	Total Disch. (cfs)
L1	Curb	0.550	1.89	26.19	3.33		0.00	3.458
L2	Curb	0.550	1.77	26.06	3.34		0.00	3.247
L3	Curb	0.550	1.87	26.17	3.33		0.00	3.423
L4	Curb	0.550	1.39	25.60	3.37		0.00	2.573
L5	Curb	0.550	1.09	25.15	3.40		0.00	2.036
L6	Curb	0.550	0.60	24.14	3.47		0.00	1.144
L7	Curb	0.550	0.51	23.88	3.49		0.00	0.978
L8	Curb	0.550	0.92	24.85	3.42		0.00	1.729
L9	Curb	0.550	0.83	24.68	3.43		0.00	1.565
L10	Curb	0.550	1.08	25.14	3.40		0.00	2.018
L11	Curb	0.550	0.74	24.48	3.44		0.00	1.401
L12	Curb	0.550	0.87	24.76	3.42		0.00	1.638
L13	Curb	0.550	1.12	25.20	3.39		0.00	2.090
L14	Curb	0.550	1.06	25.10	3.40		0.00	1.982
L15	Curb	0.550	0.54	23.97	3.48		0.00	1.033
L16	Curb	0.550	1.68	25.96	3.34		0.00	3.088
L17	Curb	0.550	0.52	23.91	3.48		0.00	0.996
M1	Curb	0.550	2.42	26.68	3.30		0.00	4.386
M2	Curb	0.550	1.89	26.19	3.33		0.00	4.386
M3	Curb	0.550	0.59	24.11	3.47		0.00	1.126
M4	Curb	0.550	0.91	24.84	3.42		0.00	1.711
M5	Curb	0.550	1.69	25.97	3.34		0.00	3.106
M6	Curb	0.550	1.29	25.46	3.38		0.00	2.395
M7	Curb	0.550	1.34	25.53	3.37		0.00	2.484
ML9	BoxMh	0.550	14.68	30.90	3.05		0.00	24.611
ML10	BoxMh	0.550	14.68	30.90	3.05		0.00	24.611
ML11	BoxMh	0.550	16.28	31.57	3.01		0.00	26.973
ML12	BoxMh	0.550	34.18	34.59	2.86		0.00	53.819
ML13	BoxMh	0.550	36.38	34.75	2.85		0.00	57.125
ML14	JctBx	0.550	36.38	34.75	2.85		0.00	57.125
MM1	BoxMh	0.550	4.90	26.89	3.28		0.00	8.845
MM2	BoxMh	0.550	8.79	28.37	3.19		0.00	15.429
MM3	BoxMh	0.550	2.98	26.04	3.34		0.00	5.469
MM4	BoxMh	0.550	3.14	26.11	3.33		0.00	5.755
MM5	BoxMh	0.550	13.64	29.87	3.10		0.00	23.290
MM6	BoxMh	0.550	17.90	32.88	2.95		0.00	28.996
M8	Curb	0.550	1.80	26.09	3.33		0.00	3.300
M9	Curb	0.550	1.71	25.99	3.34		0.00	3.141
M10	Curb	0.550	2.69	26.90	3.28		0.00	4.855
M11	Curb	0.550	1.57	25.83	3.35		0.00	2.893
ML1	BoxMh	0.550	3.66	26.26	3.32		0.00	6.688
ML2	BoxMh	0.550	5.53	26.35	3.32		0.00	10.087
ML3	BoxMh	0.550	2.48	25.67	3.36		0.00	4.584
ML4	BoxMh	0.550	1.11	24.23	3.46		0.00	2.112
ML5	BoxMh	0.550	9.12	27.88	3.22		0.00	16.155
ML6	BoxMh	0.550	1.75	24.93	3.41		0.00	3.283
ML7	BoxMh	0.550	11.95	29.40	3.13		0.00	20.579
ML8	BoxMh	0.550	1.99	25.28	3.39		0.00	3.708
MM7	BoxMh	0.550	17.90	32.88	2.95		0.00	28.996
MM8	BoxMh	0.550	17.90	32.88	2.95		0.00	28.996
OUT	Outlt	0.550	36.38	34.75	2.85		0.00	57.125

Conveyance Configuration Data

Run #	Node US	I.D. DS	FlowLine Elev. US (ft)	DS (ft)	Shape #	Span (ft)	Rise (ft)	Length (ft)	Slope (%)	n_value
1	L1	ML1	42.39	42.19	Cir 1	0.00	2.00	21.0	0.952	0.013
2	L2	ML1	42.39	42.19	Cir 1	0.00	2.00	7.0	2.858	0.013
3	ML1	ML2	42.19	41.99	Cir 1	0.00	2.00	30.0	0.667	0.013
4	L3	ML2	42.65	42.45	Cir 1	0.00	2.00	21.0	0.952	0.013
5	ML2	ML5	41.49	41.11	Cir 1	0.00	2.50	295.0	0.129	0.013
6	L4	ML3	42.27	42.07	Cir 1	0.00	2.00	21.0	0.952	0.013
7	L5	ML3	42.27	42.07	Cir 1	0.00	2.00	7.0	2.858	0.013
8	ML3	ML5	42.07	41.87	Cir 1	0.00	2.00	29.0	0.690	0.013
9	L6	ML4	42.33	42.13	Cir 1	0.00	2.00	21.0	0.952	0.013
10	L7	ML4	42.33	42.13	Cir 1	0.00	2.00	7.0	2.858	0.013
11	ML4	ML5	42.13	41.93	Cir 1	0.00	2.00	43.0	0.465	0.013
12	ML5	ML7	40.61	40.31	Cir 1	0.00	3.00	300.0	0.100	0.013
13	L8	ML6	41.99	41.79	Cir 1	0.00	2.00	21.0	0.952	0.013
14	L9	ML6	41.99	41.79	Cir 1	0.00	2.00	7.0	2.858	0.013
15	ML6	ML7	41.79	41.59	Cir 1	0.00	2.00	29.0	0.690	0.013
16	L10	ML7	42.30	42.10	Cir 1	0.00	2.00	21.0	0.952	0.013
17	ML7	ML9	39.81	39.57	Cir 1	0.00	3.50	292.0	0.082	0.013
18	L11	ML9	42.29	42.09	Cir 1	0.00	2.00	22.0	0.909	0.013
19	L12	ML8	41.98	41.78	Cir 1	0.00	2.00	7.0	2.858	0.013
20	L13	ML8	41.98	41.78	Cir 1	0.00	2.00	21.0	0.952	0.013
21	ML8	ML9	41.78	41.58	Cir 1	0.00	2.00	28.0	0.714	0.013
22	ML9	ML10	39.57	39.49	Cir 1	0.00	3.50	102.0	0.078	0.013
23	ML10	ML11	39.49	39.37	Cir 1	0.00	3.50	139.0	0.086	0.013
24	L14	ML11	42.04	41.84	Cir 1	0.00	2.00	21.0	0.952	0.013
25	L15	ML11	42.04	41.84	Cir 1	0.00	2.00	7.0	2.858	0.013
26	ML11	ML12	39.37	39.34	Cir 1	0.00	3.50	30.0	0.100	0.013
27	M1	MM1	41.89	41.69	Cir 1	0.00	2.00	50.0	0.400	0.013
28	M2	MM1	41.55	41.35	Cir 1	0.00	2.00	7.0	2.858	0.013
29	M3	MM1	41.55	41.35	Cir 1	0.00	2.00	21.0	0.952	0.013
30	MM1	MM2	39.29	38.93	Cir 1	0.00	2.50	278.0	0.129	0.013
31	M4	MM2	41.71	41.51	Cir 1	0.00	2.00	21.0	0.952	0.013
32	M5	MM3	41.47	41.27	Cir 1	0.00	2.00	21.0	0.952	0.013
33	M6	MM3	41.47	41.27	Cir 1	0.00	2.00	7.0	2.858	0.013
34	MM3	MM2	41.27	41.07	Cir 1	0.00	2.00	30.0	0.667	0.013
35	MM2	MM5	38.43	38.14	Cir 1	0.00	3.00	293.0	0.099	0.013
36	M7	MM4	41.30	41.10	Cir 1	0.00	2.00	21.0	0.952	0.013
37	M8	MM4	41.30	41.10	Cir 1	0.00	2.00	7.0	2.858	0.013
38	MM4	MM5	41.10	40.90	Cir 1	0.00	2.00	29.0	0.690	0.013
39	M9	MM5	41.51	41.31	Cir 1	0.00	2.00	22.0	0.909	0.013
40	MM5	MM6	37.64	37.15	Cir 1	0.00	3.50	601.0	0.082	0.013
41	M10	MM6	41.61	41.41	Cir 1	0.00	2.00	21.0	0.952	0.013
42	M11	MM6	41.61	41.41	Cir 1	0.00	2.00	7.0	2.858	0.013
43	MM6	MM7	37.15	37.11	Cir 1	0.00	3.50	42.0	0.095	0.013
44	MM8	ML12	37.07	36.79	Cir 1	0.00	4.00	356.0	0.079	0.013
45	ML12	ML13	36.29	36.25	Cir 1	0.00	4.50	43.0	0.093	0.013
46	L16	ML13	42.04	41.84	Cir 1	0.00	2.00	14.0	1.429	0.013
47	L17	ML13	42.04	41.84	Cir 1	0.00	2.00	14.0	1.429	0.013
48	ML13	ML14	34.25	34.13	Cir 1	0.00	4.50	99.0	0.121	0.013
49	ML14	OUT	32.29	31.97	Box 1	4.00	3.00	77.0	0.416	0.015
50	MM7	MM8	37.11	37.07	Cir 1	0.00	3.50	39.0	0.103	0.013

Conveyance Hydraulic Computations. Tailwater = 40.470 (ft)

Run #	Hyd. Gr.line US (ft)	Hyd. Gr.line DS (ft)	Crit.Elev US (ft)	Fr.Slope (%)	Depth Unif. (ft)	Depth Actual (ft)	Velocity Unif. (f/s)	Velocity Actual (f/s)	Q Cap (cfs)	Junc Loss (ft)
1*	43.12	43.11	46.56	0.023	0.54	0.92	5.12	3.89	3.5	22.2 0.000
2*	43.11	43.11	46.56	0.020	0.39	0.92	7.42	3.83	3.2	38.4 0.000
3*	43.11	43.01	47.06	0.087	0.83	1.02	5.41	4.13	6.7	18.6 0.000
4*	43.18	43.01	46.82	0.023	0.53	0.56	5.10	4.71	3.4	22.2 0.000
5	43.01	42.58	47.29	0.060	1.52	1.52	3.22	3.22	10.1	14.8 0.000
6*	42.83	42.74	46.44	0.013	0.46	0.67	4.70	2.77	2.6	22.2 0.000
7*	42.76	42.74	46.44	0.008	0.31	0.67	6.46	2.19	2.0	38.4 0.000
8*	42.74	42.58	46.94	0.041	0.67	0.71	4.94	4.60	4.6	18.9 0.000
9*	42.70	42.65	46.50	0.003	0.31	0.52	3.70	1.76	1.1	22.2 0.000
10*	42.67	42.65	46.50	0.002	0.22	0.52	5.19	1.50	1.0	38.4 0.000
11*	42.65	42.58	47.00	0.009	0.50	0.65	3.44	2.39	2.1	15.5 0.000
12	42.58	42.00	47.18	0.058	1.97	1.97	3.29	3.29	16.2	21.2 0.000
13*	42.45	42.36	46.16	0.006	0.38	0.57	4.18	2.37	1.7	22.2 0.000
14*	42.42	42.36	46.16	0.005	0.28	0.57	5.98	2.14	1.6	38.4 0.000
15*	42.36	42.00	46.66	0.021	0.57	0.57	4.49	4.49	3.3	18.9 0.000
16*	44.10	44.10	46.47	0.008	0.41	2.00	4.38	3.32	2.0	22.2 0.000
17	42.00	41.90	46.95	0.041	2.19	2.33	3.25	3.03	20.6	29.0 0.000
18*	44.09	44.09	46.46	0.004	0.35	2.00	3.87	3.04	1.4	21.7 0.000
19*	42.42	42.38	46.15	0.005	0.28	0.60	6.06	2.08	1.6	38.4 0.000
20*	42.48	42.38	46.15	0.008	0.42	0.60	4.42	2.65	2.1	22.2 0.000
21*	42.38	41.90	46.64	0.027	0.60	0.60	4.71	4.71	3.7	19.2 0.000
22	41.90	41.68	46.95	0.059	2.54	2.54	3.29	3.29	24.6	28.3 0.000
23	41.68	41.26	47.26	0.059	2.43	2.43	3.45	3.45	24.6	29.7 0.000
24*	43.84	43.84	46.21	0.008	0.41	2.00	4.35	3.32	2.0	22.2 0.000
25*	43.84	43.84	46.21	0.002	0.23	2.00	5.28	2.83	1.0	38.4 0.000
26	41.26	40.62	46.71	0.071	2.47	2.47	3.71	3.71	27.0	32.0 0.000
27	43.87	43.69	46.06	0.037	0.76	2.00	4.01	1.40	4.4	14.4 0.000
28*	41.96	41.35	45.72	0.023	0.41	0.41	7.56	7.56	3.5	38.4 0.000
29*	41.86	41.35	45.72	0.002	0.31	0.31	3.68	3.68	1.1	22.2 0.000
30	41.35	41.12	46.23	0.046	1.40	2.19	3.14	1.94	8.8	14.8 0.000
31*	43.51	43.51	45.88	0.006	0.38	2.00	4.17	3.28	1.7	22.2 0.000
32*	42.09	42.02	45.64	0.019	0.51	0.75	4.96	2.91	3.1	22.2 0.000
33*	42.02	42.02	45.64	0.011	0.34	0.75	6.78	3.51	2.4	38.4 0.000
34*	42.02	41.12	46.14	0.058	0.75	0.75	5.12	5.12	5.5	18.6 0.000
35	41.12	40.97	46.34	0.053	1.91	2.83	3.25	2.23	15.4	21.1 0.000
36*	41.86	41.86	45.47	0.012	0.45	0.76	4.65	3.56	2.5	22.2 0.000
37*	41.94	41.86	45.47	0.021	0.40	0.76	7.46	3.01	3.3	38.4 0.000
38*	41.86	40.97	45.97	0.064	0.76	0.76	5.26	5.26	5.8	18.9 0.000
39*	43.31	43.31	45.68	0.019	0.52	2.00	4.90	3.79	3.1	21.7 0.000
40	40.97	40.79	46.14	0.053	2.39	3.50	3.32	2.42	23.3	28.9 0.000
41*	43.42	43.41	45.78	0.046	0.64	2.00	5.64	4.31	4.9	22.2 0.000
42*	43.41	43.41	45.78	0.016	0.37	2.00	7.17	3.84	2.9	38.4 0.000
43	40.79	40.78	46.26	0.082	2.68	3.50	3.67	3.01	29.0	31.2 0.000
44	40.77	40.62	46.65	0.040	2.52	3.83	3.48	2.34	29.0	40.5 0.000
45	40.62	40.61	47.04	0.074	3.34	4.36	4.25	3.42	53.8	60.2 0.000
46*	43.84	43.84	46.21	0.018	0.46	2.00	5.72	3.76	3.1	27.2 0.000
47*	43.84	43.84	46.21	0.002	0.26	2.00	4.09	2.77	1.0	27.2 0.000
48	40.61	40.57	46.86	0.084	3.15	4.50	4.81	3.59	57.1	68.8 0.000
49	40.57	40.47	47.15	0.284	2.17	3.00	6.57	4.76	57.1	69.2 0.000
50	40.78	40.77	46.45	0.082	2.60	3.50	3.79	3.01	29.0	32.4 0.000

* Supercritical flow.

SUMMARY OF STORM DRAIN STRUCTURE QUANTITIES

NOTE:
The convey length should be from upstream to downstream inside box.
This length may also be used as Pay Item.
Using hydraulic length, from node center to node center, may result in profile error,
and this length should not be used as Pay Item.

LINKS:

Type of Convey Structure	Material	Rise (ft)	Span (ft)	Number of Links of this type	Quantity (ft)
Circular	Concrete	2.0	0.0	35	683.0
Circular	Concrete	2.5	0.0	2	573.0
Circular	Concrete	3.0	0.0	2	593.0
Circular	Concrete	3.5	0.0	7	1245.0
Circular	Concrete	4.0	0.0	1	356.0
Circular	Concrete	4.5	0.0	2	142.0
Box	Concrete	3.0	4.0	1	77.0

NODES:

Type of Inlet Structure	Type of Grate	Inlet Length (ft)	Grate Width (ft)	Grate Length (ft)	Grate Area (ft)	Grate Perimeter (ft)	Quantity (each)
Curb In Sag		5.0	0.0	0.0	0.0	0.0	28
Box Manhole		0.0	0.0	0.0	0.0	0.0	21
Junction Box		0.0	0.0	0.0	0.0	0.0	1
Outlet		0.0	0.0	0.0	0.0	0.0	1

END

NORMAL TERMINATION OF HOUSTORM.

Warning Messages for current project:

Runoff Frequency of: 2 Years
Discharge decreased downstream node Id= ML10 Previous intensity used.
Discharge decreased downstream node Id= MM7 Previous intensity used.
Discharge decreased downstream node Id= MM8 Previous intensity used.
Discharge decreased downstream node Id= ML14 Previous intensity used.
Decreasing conduit size @ downstream Run# 49
HGL elevation below invert. Downstream HGL set to soffit elevation at Run# 46
HGL elevation below invert. Downstream HGL set to soffit elevation at Run# 47
HGL elevation below invert. Downstream HGL set to soffit elevation at Run# 24
HGL elevation below invert. Downstream HGL set to soffit elevation at Run# 25
HGL elevation below invert. Downstream HGL set to soffit elevation at Run# 41
HGL elevation below invert. Downstream H

HouStorm (City Of Houston STORM DRAIN DESIGN) Version 2.1, Update:
Nov/01/2007

Run @ 6/16/2010 5:09:14 PM

PROJECT NAME : NSR 446A
JOB NUMBER : 09-051
PROJECT DESCRIPTION : Cloverdale Proposed System (2-Year)
PROJECT File: X:\09-051 - Houston - NSR 446a\Design\Design Data\HouStorm\FINAL DESIGN\Proposed Systems\2-Year\Text Files\Cloverdale-2yr.txt

ANALYSYS FREQUENCY : 2 Years
MEASUREMENT UNITS: ENGLISH

OUTPUT FOR ANALYSYS FREQUENCY of: 2 Years

Runoff Computation for Design Frequency.

ID	C Value	Area (acre)	Tc (min)	Tc Used (min)	Intensity (in/hr)	Supply Q (cfs)	Total Q (cfs)
C1	0.55	1.31	25.49	25.49	3.37	0.000	2.431
C2	0.55	1.10	25.17	25.17	3.40	0.000	2.054
C3	0.55	1.15	25.25	25.25	3.39	0.000	2.144
C4	0.55	2.34	26.61	26.61	3.30	0.000	4.247
C5	0.55	1.66	25.93	25.93	3.34	0.000	3.053
C6	0.55	1.16	25.26	25.26	3.39	0.000	2.162
C7	0.55	1.06	25.10	25.10	3.40	0.000	1.982
C8	0.55	1.16	25.26	25.26	3.39	0.000	2.162
C9	0.55	1.70	25.98	25.98	3.34	0.000	3.124
C10	0.55	1.30	25.47	25.47	3.37	0.000	2.413

On Grade Inlet Configuration Data

Inlet ID	Inlet Type	Inlet Length (ft)	Slopes Long (%)	Slopes Trans (%)	Gutter n	Gutter Depr. (ft)	Grate Width (ft)	Grate Type	Pond Width Allowed (ft)
C6	Curb	5.00	0.30	2.00	0.014	0.33	n/a	n/a	13.50
C7	Curb	5.00	0.30	2.00	0.014	0.33	n/a	n/a	13.50

On Grade Inlets Computation Data.

Inlet ID	Inlet Type	Total Q (cfs)	Intercept Capacity (cfs)	Q Bypass Allow (cfs)	Q Bypass Actual (cfs)	To Inlet ID	Required Length (ft)	Actual Length (ft)	Ponded Width (ft)
C6	Curb	2.162	2.075	1.000	0.088	C8	6.01	5.00	11.45
C7	Curb	1.982	1.935	1.000	0.047	C9	5.72	5.00	11.10

Sag Inlets Configuration Data.

Inlet ID	Inlet Type	Length/ Perim (ft)	Grate Area (sf)	Left-Slope Longi (%)	Left-Slope Transv (%)	Right-Slope Longi (%)	Right-Slope Transv (%)	n	Gutter DeprW (ft)	Head Allowed (ft)
C1	Curb	5.00	0.00	2.05	2.00	0.30	2.00	0.014	1.50	0.57
C2	Curb	5.00	0.00	0.30	2.00	2.86	2.00	0.014	1.50	0.57
C3	Curb	5.00	0.00	0.45	2.00	1.16	2.00	0.014	1.50	0.57
C4	Curb	5.00	0.00	0.33	2.00	0.33	2.00	0.014	1.50	0.57
C5	Curb	5.00	0.00	1.93	2.00	0.31	2.00	0.014	1.50	0.57
C8	Curb	5.00	0.00	0.30	2.00	1.35	2.00	0.014	1.50	0.57
C9	Curb	5.00	0.00	1.35	2.00	0.30	2.00	0.014	1.50	0.57
C10	Curb	5.00	0.00	0.30	2.00	0.30	2.00	0.014	1.50	0.57

Sag Inlets Computation Data.

Inlet ID	Inlet Type	Length (ft)	Grate Perim (ft)	Grate Area (sf)	Total Q (cfs)	Inlet Capacity (cfs)	Actual Head (ft)	Ponded Left (ft)	Width Right (ft)
C1	Curb	5.00	n/a	n/a	2.431	7.601	0.283	6.45	9.25
C2	Curb	5.00	n/a	n/a	2.054	7.601	0.273	8.70	5.70
C3	Curb	5.00	n/a	n/a	2.144	7.601	0.275	8.15	6.85
C4	Curb	5.00	n/a	n/a	4.247	7.601	0.350	11.20	11.20
C5	Curb	5.00	n/a	n/a	3.053	7.601	0.302	7.10	10.00
C8	Curb	5.00	n/a	n/a	2.250	7.601	0.278	9.00	6.75
C9	Curb	5.00	n/a	n/a	3.171	7.601	0.306	7.70	10.20
C10	Curb	5.00	n/a	n/a	2.413	7.601	0.282	9.20	9.20

Cumulative Junction Discharge Computations

Node I.D.	Node Type	Weighted C-Value	Cumulat. Dr.Area (acres)	Cumulat. Tc (min)	Intens. (in/hr)	User Supply Q cfs)	Additional Q in Node (cfs)	Total Disch. (cfs)
C1	Curb	0.550	1.31	25.49	3.37		0.00	2.431
C2	Curb	0.550	1.10	25.17	3.40		0.00	2.054
C3	Curb	0.550	1.15	25.25	3.39		0.00	2.144
C4	Curb	0.550	2.34	26.61	3.30		0.00	4.247
C5	Curb	0.550	4.00	26.71	3.29		0.00	7.246
C6	Curb	0.550	1.16	25.26	3.39		0.00	2.162
C7	Curb	0.550	1.06	25.10	3.40		0.00	1.982
C8	Curb	0.550	1.16	25.26	3.39		0.00	2.162
C9	Curb	0.550	1.70	25.98	3.34		0.00	3.124
C10	Curb	0.550	1.30	25.47	3.37		0.00	2.413
MC1	BoxMh	0.550	2.41	25.57	3.37		0.00	4.465
MC2	BoxMh	0.550	2.41	25.57	3.37		0.00	4.465
MC3	BoxMh	0.550	3.56	27.00	3.28		0.00	6.413
MC4	BoxMh	0.550	7.56	27.11	3.27		0.00	13.588
MC5	BoxMh	0.550	7.56	27.11	3.27		0.00	13.588
MC6	BoxMh	0.550	7.56	27.11	3.27		0.00	13.588
MC7	BoxMh	0.550	7.56	27.11	3.27		0.00	13.588
MC8	BoxMh	0.550	9.78	28.40	3.19		0.00	17.156
MC9	BoxMh	0.550	12.64	29.99	3.10		0.00	21.536
MC10	BoxMh	0.550	13.94	30.18	3.09		0.00	23.668
OUT	Outlt	0.550	13.94	30.18	3.09		0.00	23.668

Conveyance Configuration Data

Run #	Node US	I.D. DS	FlowLine Elev. US (ft)	FlowLine Elev. DS (ft)	Shape #	Span (ft)	Rise (ft)	Length (ft)	Slope (%)	n_value
1	C1	MC1	43.11	42.91	Cir 1	0.00	2.00	21.0	0.952	0.013
2	C2	MC1	43.11	42.91	Cir 1	0.00	2.00	7.0	2.858	0.013
3	MC1	MC2	42.91	42.71	Cir 1	0.00	2.00	28.0	0.714	0.013
4	MC2	MC3	40.90	40.44	Cir 1	0.00	2.00	257.0	0.179	0.013
5	C3	MC3	43.21	43.01	Cir 1	0.00	2.00	7.0	2.858	0.013
6	MC3	MC4	40.44	40.36	Cir 1	0.00	2.00	27.0	0.296	0.013
7	C4	C5	42.99	42.79	Cir 1	0.00	2.00	28.0	0.714	0.013
8	C5	MC4	42.79	42.59	Cir 1	0.00	2.00	46.0	0.435	0.013
9	MC4	MC5	39.86	39.76	Cir 1	0.00	2.50	79.0	0.127	0.013
10	MC5	MC6	39.76	39.60	Cir 1	0.00	2.50	121.0	0.132	0.013
11	MC6	MC7	39.60	39.50	Cir 1	0.00	2.50	74.0	0.135	0.013
12	MC7	MC8	39.50	39.16	Cir 1	0.00	2.50	263.0	0.129	0.013
13	C6	MC8	43.05	42.85	Cir 1	0.00	2.00	7.0	2.858	0.013
14	C7	MC8	43.05	42.85	Cir 1	0.00	2.00	21.0	0.952	0.013
15	MC8	MC9	38.66	38.34	Cir 1	0.00	3.00	318.0	0.101	0.013
16	C8	MC9	42.08	41.88	Cir 1	0.00	2.00	7.0	2.858	0.013
17	C9	MC9	42.08	41.88	Cir 1	0.00	2.00	21.0	0.952	0.013
18	MC9	MC10	38.34	38.29	Cir 1	0.00	3.00	43.0	0.116	0.013
19	C10	MC10	42.34	42.14	Cir 1	0.00	2.00	7.0	2.858	0.013
20	MC10	OUT	37.79	37.59	Cir 1	0.00	3.50	247.0	0.081	0.013

Conveyance Hydraulic Computations. Tailwater = 41.090 (ft)

Run #	Hyd. Gr.line US (ft)	Hyd. Gr.line DS (ft)	Crit.Elev US (ft)	Fr.Slope (%)	Depth Unif. (ft)	Depth Actual (ft)	Velocity Unif. (f/s)	Velocity Actual (f/s)	Q (cfs)	Cap (cfs)	Junc Loss (ft)
1*	44.72	44.72	47.28	0.011	0.45	1.81	4.62	3.54	2.4	22.2	0.000
2*	44.72	44.72	47.28	0.008	0.31	1.81	6.48	3.37	2.1	38.4	0.000
3*	44.72	44.71	47.79	0.039	0.66	2.00	4.96	4.20	4.5	19.2	0.000
4	42.06	41.82	48.29	0.039	0.96	1.38	2.99	1.94	4.5	9.6	0.000
5*	45.01	45.01	47.38	0.009	0.32	2.00	6.56	3.38	2.1	38.4	0.000
6	41.82	41.77	47.89	0.080	1.02	1.41	3.96	2.70	6.4	12.4	0.000
7*	44.76	44.75	47.16	0.035	0.64	1.96	4.89	4.14	4.2	19.2	0.000
8	44.75	44.59	47.16	0.102	0.98	2.00	4.71	2.31	7.2	15.0	0.000
9	41.77	41.64	47.99	0.109	1.91	1.91	3.37	3.37	13.6	14.7	0.000
10	41.64	41.46	48.33	0.109	1.88	1.88	3.44	3.44	13.6	15.0	0.000
11	41.46	41.39	48.70	0.109	1.86	1.89	3.48	3.40	13.6	15.1	0.000
12	41.39	41.30	48.57	0.109	1.89	2.14	3.40	3.04	13.6	14.8	0.000
13*	44.85	44.85	47.22	0.009	0.32	2.00	6.58	3.42	2.2	38.4	0.000
14*	44.85	44.85	47.22	0.008	0.41	2.00	4.35	3.32	2.0	22.2	0.000
15	41.30	41.17	47.70	0.066	2.05	2.83	3.33	2.48	17.2	21.2	0.000
16*	43.88	43.88	46.25	0.009	0.32	2.00	6.58	3.42	2.2	38.4	0.000
17*	43.88	43.88	46.25	0.019	0.51	2.00	4.97	3.79	3.1	22.2	0.000
18	41.17	41.16	46.69	0.103	2.32	2.87	3.67	3.09	21.5	22.8	0.000
19*	44.14	44.14	46.51	0.011	0.34	2.00	6.80	3.53	2.4	38.4	0.000
20	41.16	41.09	46.99	0.055	2.43	3.50	3.31	2.46	23.7	28.8	0.000

* Supercritical flow.

SUMMARY OF STORM DRAIN STRUCTURE QUANTITIES

NOTE:
The convey length should be from upstream to downstream inside box.
This length may also be used as Pay Item.
Using hydraulic length, from node center to node center, may result in profile error,
and this length should not be used as Pay Item.

LINKS:

Type of Convey Structure	Material	Rise (ft)	Span (ft)	Number of Links of this type	Quantity (ft)
Circular	Concrete	2.0	0.0	13	484.0
Circular	Concrete	2.5	0.0	4	537.0
Circular	Concrete	3.0	0.0	2	361.0
Circular	Concrete	3.5	0.0	1	247.0

NODES:

Type of Inlet Structure	Type of Grate	Inlet Length (ft)	Grate Width (ft)	Grate Length (ft)	Grate Area (ft)	Grate Perimeter (ft)	Quantity (each)
Curb In Sag		5.0	0.0	0.0	0.0	0.0	8
Curb On Grade		5.0	0.0	0.0	0.0	0.0	2
Box Manhole		0.0	0.0	0.0	0.0	0.0	10
Outlet		0.0	0.0	0.0	0.0	0.0	1

END

NORMAL TERMINATION OF HOUSTORM.

Warning Messages for current project:

Runoff Frequency of: 2 Years
Discharge decreased downstream node Id= MC2 Previous intensity used.
Discharge decreased downstream node Id= MC5 Previous intensity used.
Discharge decreased downstream node Id= MC6 Previous intensity used.
Discharge decreased downstream node Id= MC7 Previous intensity used.
Capacity of grade inlet exceeded at inlet Id= C6
Capacity of grade inlet exceeded at inlet Id= C7
HGL elevation below invert. Downstream HGL set to soffit elevation at Run# 19
HGL elevation below invert. Downstream HGL set to soffit elevation at Run# 16
HGL elevation below invert. Downstream HGL set to soffit elevation at Run# 17
HGL elevation below invert. Downstream HGL set to soffit elevation at Run# 13
HGL elevation below invert. Downstream HGL set to soffit elevation at Run# 14
HGL elevation below invert. Downstream HGL set to soffit elevation at Run# 8
HGL elevation below invert. Downstream HGL set to soffit elevation at Run# 5
HGL elevation below invert. Downstream HGL set to soffit elevation at Run# 3

HouStorm (City Of Houston STORM DRAIN DESIGN) Version 2.1, Update:
Nov/01/2007

Run @ 8/24/2010 11:07:17 AM

PROJECT NAME : NSR 446A
JOB NUMBER : 09-051
PROJECT DESCRIPTION : Durhill Proposed System (2-Year)
PROJECT File: X:\09-051 - Houston - NSR 446a\Design\Design Data\HouStorm\FINAL DESIGN\Proposed Systems\2-Year\Text Files\Durhill-2yr.txt

ANALYSYS FREQUENCY : 2 Years
MEASUREMENT UNITS: ENGLISH

OUTPUT FOR ANALYSYS FREQUENCY of: 2 Years

Runoff Computation for Design Frequency.

ID	C Value	Area (acre)	Tc (min)	Tc Used (min)	Intensity (in/hr)	Supply Q (cfs)	Total Q (cfs)
D1	0.55	1.11	25.19	25.19	3.39	0.000	2.072
D2	0.55	1.04	25.07	25.07	3.40	0.000	1.946
D3	0.55	1.46	25.69	25.69	3.36	0.000	2.698
D4	0.55	2.88	27.05	27.05	3.27	0.000	5.183
D5	0.55	0.78	24.57	24.57	3.44	0.000	1.474
D6	0.55	2.25	26.54	26.54	3.30	0.000	4.089
D7	0.55	0.90	24.82	24.82	3.42	0.000	1.692
D8	0.55	0.82	24.66	24.66	3.43	0.000	1.547
D9	0.55	1.19	25.31	25.31	3.39	0.000	2.216
D10	0.55	1.58	25.84	25.84	3.35	0.000	2.911
D11	0.55	1.32	25.50	25.50	3.37	0.000	2.449
D12	0.55	1.13	25.22	25.22	3.39	0.000	2.108

On Grade Inlet Configuration Data

Inlet ID	Inlet Type	Inlet Length (ft)	Slopes Long (%)	Slopes Trans (%)	Gutter n	Gutter Depr. (ft)	Grate Width (ft)	Grate Type	Pond Width Allowed (ft)
D8	Curb	5.00	0.30	2.00	0.014	0.33	n/a	n/a	13.00
D11	Curb	5.00	0.33	2.00	0.014	0.33	n/a	n/a	13.50
D12	Curb	5.00	0.33	2.00	0.014	0.33	n/a	n/a	13.50

On Grade Inlets Computation Data.

Inlet ID	Inlet Type	Total Q (cfs)	Intercept Capacity (cfs)	Q Bypass Allow (cfs)	Q Bypass Actual (cfs)	To Inlet ID	Required Length (ft)	Actual Length (ft)	Ponded Width (ft)
D8	Curb	1.547	1.547	1.000	0.000	D7	4.94	5.00	10.10
D11	Curb	2.449	2.256	1.000	0.193	D9	6.61	5.00	11.80
D12	Curb	2.108	2.018	1.000	0.090	D10	6.05	5.00	11.15

Sag Inlets Configuration Data.

Inlet ID	Inlet Type	Length/ Perim (ft)	Grate Area (sf)	Left-Slope Longi (%)	Left-Slope Transv (%)	Right-Slope Longi (%)	Right-Slope Transv (%)	n	Gutter DeprW (ft)	Head Allowed (ft)
D1	Curb	5.00	0.00	2.51	2.00	0.70	2.00	0.014	1.50	0.57
D2	Curb	5.00	0.00	0.70	2.00	2.24	2.00	0.014	1.50	0.57
D3	Curb	5.00	0.00	0.30	2.00	0.44	2.00	0.014	1.50	0.57
D4	Curb	8.00	0.00	2.01	2.00	0.30	2.00	0.014	1.50	0.57
D5	Curb	5.00	0.00	1.00	2.00	1.33	2.00	0.014	1.50	0.57
D6	Curb	8.00	0.00	0.30	2.00	1.16	2.00	0.014	1.50	0.57
D7	Curb	5.00	0.00	1.33	2.00	1.85	2.00	0.014	1.50	0.57
D9	Curb	5.00	0.00	0.33	2.00	1.00	2.00	0.014	1.50	0.57
D10	Curb	5.00	0.00	1.70	2.00	0.33	2.00	0.014	1.50	0.57

Sag Inlets Computation Data.

Inlet ID	Inlet Type	Length (ft)	Grate Perim (ft)	Grate Area (sf)	Total Q (cfs)	Inlet Capacity (cfs)	Actual Head (ft)	Ponded Left (ft)	Width Right (ft)
D1	Curb	5.00	n/a	n/a	2.072	7.601	0.274	5.85	7.40
D2	Curb	5.00	n/a	n/a	1.946	7.601	0.271	7.25	5.85
D3	Curb	5.00	n/a	n/a	2.698	7.601	0.290	9.60	8.95
D4	Curb	8.00	n/a	n/a	5.183	10.591	0.354	8.60	12.30
D5	Curb	5.00	n/a	n/a	1.474	7.601	0.262	6.10	5.80
D6	Curb	8.00	n/a	n/a	4.089	10.591	0.302	11.25	8.70
D7	Curb	5.00	n/a	n/a	1.692	7.601	0.266	6.10	5.75
D9	Curb	5.00	n/a	n/a	2.408	7.601	0.282	9.05	7.35
D10	Curb	5.00	n/a	n/a	3.001	7.601	0.300	7.20	9.85

Cumulative Junction Discharge Computations

Node I.D.	Node Type	Weighted C-Value	Cumulat. Dr.Area (acres)	Cumulat. Tc (min)	Intens. (in/hr)	User Supply Q cfs)	Additional Q in Node (cfs)	Total Disch. (cfs)
D1	Curb	0.550	1.11	25.19	3.39		0.00	2.072
D2	Curb	0.550	1.04	25.07	3.40		0.00	1.946
D3	Curb	0.550	1.46	25.69	3.36		0.00	2.698
D4	Curb	0.550	2.88	27.05	3.27		0.00	5.183
D5	Curb	0.550	0.78	24.57	3.44		0.00	1.474
D6	Curb	0.550	2.25	26.54	3.30		0.00	4.089
D7	Curb	0.550	0.90	24.82	3.42		0.00	1.692
D8	Curb	0.550	0.82	24.66	3.43		0.00	1.547
D9	Curb	0.550	1.19	25.31	3.39		0.00	2.216
D10	Curb	0.550	1.58	25.84	3.35		0.00	2.911
D11	Curb	0.550	1.32	25.50	3.37		0.00	2.449
D12	Curb	0.550	1.13	25.22	3.39		0.00	2.108
MD1	BoxMh	0.550	2.15	25.21	3.39		0.00	4.012
MD2	BoxMh	0.550	3.61	25.77	3.35		0.00	6.661
MD3	BoxMh	0.550	3.61	25.77	3.35		0.00	6.661
MD4	BoxMh	0.550	14.78	29.14	3.15		0.00	25.573
MD5	BoxMh	0.550	16.46	29.27	3.14		0.00	28.412
MD6	BoxMh	0.550	8.29	28.93	3.16		0.00	14.400
MD7	BoxMh	0.550	6.04	27.86	3.22		0.00	10.703
MD8	BoxMh	0.550	5.22	27.62	3.24		0.00	9.292
MD9	BoxMh	0.550	5.22	27.62	3.24		0.00	9.292
MD10	BoxMh	0.550	2.45	25.52	3.37		0.00	4.543
OUT	Outlt	0.550	16.46	29.27	3.14		0.00	28.412

Conveyance Configuration Data

Run #	Node US	I.D. DS	FlowLine Elev. US (ft)	FlowLine Elev. DS (ft)	Shape #	Span (ft)	Rise (ft)	Length (ft)	Slope (%)	n_value
1	D1	MD1	42.16	41.96	Cir 1	0.00	2.00	7.0	2.858	0.013
2	D2	MD1	42.16	41.96	Cir 1	0.00	2.00	21.0	0.952	0.013
3	MD1	MD2	41.96	41.76	Cir 1	0.00	2.00	28.0	0.714	0.013
4	D3	MD2	42.68	42.48	Cir 1	0.00	2.00	22.0	0.909	0.013
5	MD2	MD3	40.32	39.92	Cir 1	0.00	2.00	202.0	0.198	0.013
6	MD3	MD4	38.92	37.49	Cir 1	0.00	2.00	564.0	0.254	0.013
7	D4	MD4	41.11	40.91	Cir 1	0.00	2.00	35.0	0.571	0.013
8	D12	MD10	43.07	42.87	Cir 1	0.00	2.00	21.0	0.952	0.013
9	D11	MD10	43.07	42.87	Cir 1	0.00	2.00	7.0	2.858	0.013
10	MD10	MD9	42.29	41.59	Cir 1	0.00	2.00	382.0	0.183	0.013
11	D10	MD9	41.79	41.59	Cir 1	0.00	2.00	21.0	0.952	0.013
12	D9	MD9	41.79	41.59	Cir 1	0.00	2.00	7.0	2.858	0.013
13	MD9	MD8	41.09	41.03	Cir 1	0.00	2.50	42.0	0.143	0.013
14	MD8	MD7	39.78	39.72	Cir 1	0.00	2.50	46.0	0.130	0.013
15	D8	MD7	41.98	41.78	Cir 1	0.00	2.00	7.0	2.858	0.013
16	MD7	MD6	38.87	38.59	Cir 1	0.00	2.50	212.0	0.132	0.013
17	D6	MD6	41.33	41.13	Cir 1	0.00	2.00	21.0	0.952	0.013
18	MD6	MD4	36.84	36.79	Cir 1	0.00	3.00	43.0	0.116	0.013
19	MD4	MD5	34.79	34.76	Cir 1	0.00	3.50	29.0	0.103	0.013
20	D5	MD5	40.85	40.65	Cir 1	0.00	2.00	7.0	2.858	0.013
21	D7	MD5	40.85	40.65	Cir 1	0.00	2.00	21.0	0.952	0.013
22	MD5	OUT	34.76	34.59	Cir 1	0.00	3.50	176.0	0.097	0.013

Conveyance Hydraulic Computations. Tailwater = 39.320 (ft)

Run #	Hyd. Gr.line US (ft)	Hyd. Gr.line DS (ft)	Crit.Elev US (ft)	Fr.Slope (%)	Depth Unif. (ft)	Depth Actual (ft)	Velocity Unif. (f/s)	Velocity Actual (f/s)	Q (cfs)	Cap (cfs)	Junc Loss (ft)
1	43.97	43.77	46.33	0.008	0.32	1.81	6.50	0.69	2.1	38.4	0.000
2*	43.77	43.77	46.33	0.007	0.40	1.81	4.33	3.39	1.9	22.2	0.000
3*	43.77	43.76	46.85	0.031	0.62	2.00	4.82	4.07	4.0	19.2	0.000
4*	44.48	44.48	46.85	0.014	0.48	2.00	4.69	3.64	2.7	21.7	0.000
5	41.51	40.15	47.29	0.086	1.19	1.19	3.43	3.43	6.7	10.1	0.000
6	40.15	39.36	47.86	0.086	1.10	1.87	3.77	2.18	6.7	11.4	0.000
7*	42.93	42.91	45.28	0.052	0.75	2.00	4.77	4.40	5.2	17.2	0.000
8*	43.49	43.25	47.24	0.009	0.42	0.42	4.43	4.43	2.1	22.2	0.000
9*	43.41	43.25	47.24	0.012	0.34	0.38	6.83	5.79	2.4	38.4	0.000
10	43.25	42.38	47.74	0.040	0.96	0.96	3.03	3.03	4.5	9.7	0.000
11*	42.42	42.38	45.96	0.010	0.49	0.79	4.87	2.51	2.9	22.2	0.000
12*	42.38	42.38	45.96	0.010	0.33	0.79	6.63	3.45	2.2	38.4	0.000
13	42.38	41.09	46.44	0.051	1.40	1.40	3.30	3.30	9.3	15.6	0.000
14	41.09	40.44	46.79	0.051	1.44	1.44	3.19	3.19	9.3	14.9	0.000
15*	43.78	43.78	46.15	0.005	0.27	2.00	5.96	3.08	1.5	38.4	0.000
16	40.44	39.39	46.63	0.068	1.57	1.57	3.30	3.30	10.7	15.0	0.000
17*	43.14	43.13	45.50	0.032	0.58	2.00	5.37	4.10	4.1	22.2	0.000
18	39.39	39.36	46.00	0.046	1.73	2.57	3.40	2.23	14.4	22.8	0.000
19	39.36	39.35	46.10	0.064	2.35	3.50	3.72	2.66	25.6	32.5	0.000
20*	42.65	42.65	45.02	0.004	0.27	2.00	5.87	3.09	1.5	38.4	0.000
21*	42.65	42.65	45.02	0.006	0.37	2.00	4.16	3.19	1.7	22.2	0.000
22	39.35	39.32	45.52	0.079	2.63	3.50	3.67	2.95	28.4	31.4	0.000

* Supercritical flow.

SUMMARY OF STORM DRAIN STRUCTURE QUANTITIES

NOTE:
The convey length should be from upstream to downstream inside box.
This length may also be used as Pay Item.
Using hydraulic length, from node center to node center, may result in profile error,
and this length should not be used as Pay Item.

LINKS:

Type of Convey Structure	Material	Rise (ft)	Span (ft)	Number of Links of this type	Quantity (ft)
Circular	Concrete	2.0	0.0	16	1373.0
Circular	Concrete	2.5	0.0	3	300.0
Circular	Concrete	3.0	0.0	1	43.0
Circular	Concrete	3.5	0.0	2	205.0

NODES:

Type of Inlet Structure	Type of Grate	Inlet Length (ft)	Grate Width (ft)	Grate Length (ft)	Grate Area (ft)	Grate Perimeter (ft)	Quantity (each)
Curb In Sag		5.0	0.0	0.0	0.0	0.0	7
Curb In Sag		8.0	0.0	0.0	0.0	0.0	2
Curb On Grade		5.0	0.0	0.0	0.0	0.0	3
Box Manhole		0.0	0.0	0.0	0.0	0.0	10
Outlet		0.0	0.0	0.0	0.0	0.0	1

END

NORMAL TERM

HouStorm (City Of Houston STORM DRAIN DESIGN) Version 2.1, Update: Nov/01/2007

Run @ 8/23/2010 2:20:48 PM

PROJECT NAME : NSR 446A
JOB NUMBER : 09-051
PROJECT DESCRIPTION : Latma-Murworth Proposed System (100-Year)
PROJECT File: X:\09-051 - Houston - NSR 446a\Design\Design Data\HouStorm\FINAL DESIGN\Proposed Systems\100-Year\Text Files\Latma-Murworth-100yr.txt

ANALYSYS FREQUENCY : 100 Years
MEASUREMENT UNITS: ENGLISH

OUTPUT FOR ANALYSYS FREQUENCY of: 100 Years

Runoff Computation for Design Frequency.

ID	C Value	Area (acre)	Tc (min)	Tc Used (min)	Intensity (in/hr)	Supply Q (cfs)	Total Q (cfs)
L1	0.55	1.89	26.19	26.19	6.88	0.000	7.149
L2	0.55	1.77	26.06	26.06	6.89	0.000	6.709
L3	0.55	1.87	26.17	26.17	6.88	0.000	7.076
L4	0.55	1.39	25.60	25.60	6.94	0.000	5.307
L5	0.55	1.09	25.15	25.15	6.99	0.000	4.191
L6	0.55	0.60	24.14	24.14	7.11	0.000	2.345
L7	0.55	0.51	23.88	23.88	7.14	0.000	2.002
L8	0.55	0.92	24.85	24.85	7.03	0.000	3.555
L9	0.55	0.83	24.68	24.68	7.04	0.000	3.216
L10	0.55	1.08	25.14	25.14	6.99	0.000	4.154
L11	0.55	0.74	24.48	24.48	7.07	0.000	2.876
L12	0.55	0.87	24.76	24.76	7.04	0.000	3.366
L13	0.55	1.12	25.20	25.20	6.99	0.000	4.303
L14	0.55	1.06	25.10	25.10	7.00	0.000	4.079
L15	0.55	0.54	23.97	23.97	7.13	0.000	2.117
L16	0.55	1.68	25.96	25.96	6.90	0.000	6.378
L17	0.55	0.52	23.91	23.91	7.13	0.000	2.040
M10	0.55	2.69	26.90	26.90	6.80	0.000	10.064
M11	0.55	1.57	25.83	25.83	6.92	0.000	5.972
M1	0.55	2.42	26.68	26.68	6.83	0.000	9.085
M2	0.55	1.89	26.19	26.19	6.88	0.000	7.149
M3	0.55	0.59	24.11	24.11	7.11	0.000	2.307
M4	0.55	0.91	24.84	24.84	7.03	0.000	3.517
M5	0.55	1.69	25.97	25.97	6.90	0.000	6.415
M6	0.55	1.29	25.46	25.46	6.96	0.000	4.936
M7	0.55	1.34	25.53	25.53	6.95	0.000	5.122
M8	0.55	1.80	26.09	26.09	6.89	0.000	6.819
M9	0.55	1.71	25.99	25.99	6.90	0.000	6.489

Sag Inlets Configuration Data.

Inlet ID	Inlet Type	Length/ Perim (ft)	Grate Area (sf)	Grate (%)	Left-Slope Longi (%)	Left-Slope Transv (%)	Right-Slope Longi (%)	Right-Slope Transv (%)	n	Gutter Deprw (ft)	Head Allowed (ft)
L1	Curb	5.00	0.00	0.30	2.00	1.58	2.00	0.014	1.50	0.57	
L2	Curb	5.00	0.00	1.16	2.00	0.30	2.00	0.014	1.50	0.57	
L3	Curb	5.00	0.00	0.50	2.00	0.50	2.00	0.014	1.50	0.57	
L4	Curb	5.00	0.00	0.30	2.00	1.39	2.00	0.014	1.50	0.57	
L5	Curb	5.00	0.00	1.39	2.00	0.30	2.00	0.014	1.50	0.57	
L6	Curb	5.00	0.00	1.16	2.00	1.50	2.00	0.014	1.50	0.57	
L7	Curb	5.00	0.00	1.34	2.00	1.16	2.00	0.014	1.50	0.57	
L8	Curb	5.00	0.00	0.30	2.00	1.77	2.00	0.014	1.50	0.57	
L9	Curb	5.00	0.00	0.50	2.00	0.50	2.00	0.014	1.50	0.57	
L10	Curb	5.00	0.00	0.50	2.00	0.50	2.00	0.014	1.50	0.57	
L11	Curb	5.00	0.00	0.35	2.00	0.30	2.00	0.014	1.50	0.57	
L12	Curb	5.00	0.00	1.54	2.00	0.30	2.00	0.014	1.50	0.57	
L13	Curb	5.00	0.00	0.31	2.00	1.54	2.00	0.014	1.50	0.57	
L14	Curb	5.00	0.00	0.39	2.00	1.85	2.00	0.014	1.50	0.57	
L15	Curb	5.00	0.00	1.16	2.00	0.39	2.00	0.014	1.50	0.57	
L16	Curb	5.00	0.00	2.74	2.00	0.30	2.00	0.014	1.50	0.57	
L17	Curb	5.00	0.00	0.30	2.00	1.16	2.00	0.014	1.50	0.57	
M1	Curb	5.00	0.00	0.35	2.00	0.30	2.00	0.014	1.50	0.57	
M2	Curb	5.00	0.00	1.58	2.00	0.44	2.00	0.014	1.50	0.57	
M3	Curb	5.00	0.00	0.44	2.00	2.43	2.00	0.014	1.50	0.57	
M4	Curb	5.00	0.00	0.34	2.00	0.30	2.00	0.014	1.50	0.57	
M5	Curb	5.00	0.00	1.43	2.00	0.44	2.00	0.014	1.50	0.57	
M6	Curb	5.00	0.00	0.44	2.00	1.16	2.00	0.014	1.50	0.57	
M7	Curb	5.00	0.00	1.20	2.00	0.43	2.00	0.014	1.50	0.57	
M8	Curb	5.00	0.00	0.43	2.00	1.16	2.00	0.014	1.50	0.57	
M9	Curb	5.00	0.00	0.30	2.00	0.34	2.00	0.014	1.50	0.57	
M10	Curb	5.00	0.00	0.30	2.00	0.31	2.00	0.014	1.50	0.57	
M11	Curb	5.00	0.00	0.31	2.00	0.30	2.00	0.014	1.50	0.57	

Sag Inlets Computation Data.

Inlet ID	Inlet Type	Length (ft)	Grate Perim (ft)	Grate Area (sf)	Total Q (cfs)	Inlet Capacity (cfs)	Actual Head (ft)	Ponded Left (ft)	Width Right (ft)
L1	Curb	5.00	n/a	n/a	7.149	7.601	0.533	13.85	10.15
L2	Curb	5.00	n/a	n/a	6.709	7.601	0.499	10.50	13.55
L3	Curb	5.00	n/a	n/a	7.076	7.601	0.527	12.55	12.55
L4	Curb	5.00	n/a	n/a	5.307	7.601	0.406	12.40	9.30
L5	Curb	5.00	n/a	n/a	4.191	7.601	0.347	8.50	11.35
L6	Curb	5.00	n/a	n/a	2.345	7.601	0.280	7.05	6.75
L7	Curb	5.00	n/a	n/a	2.002	7.601	0.272	6.50	6.65
L8	Curb	5.00	n/a	n/a	3.555	7.601	0.320	10.65	7.65
L9	Curb	5.00	n/a	n/a	3.216	7.601	0.307	9.35	9.35
L10	Curb	5.00	n/a	n/a	4.154	7.601	0.346	10.25	10.25
L11	Curb	5.00	n/a	n/a	2.876	7.601	0.296	9.55	9.85
L12	Curb	5.00	n/a	n/a	3.366	7.601	0.313	7.70	10.45
L13	Curb	5.00	n/a	n/a	4.303	7.601	0.353	11.40	8.40
L14	Curb	5.00	n/a	n/a	4.079	7.601	0.342	10.70	8.00
L15	Curb	5.00	n/a	n/a	2.117	7.601	0.275	6.80	8.35
L16	Curb	5.00	n/a	n/a	6.378	7.601	0.475	8.75	13.25
L17	Curb	5.00	n/a	n/a	2.040	7.601	0.273	8.65	6.70
M1	Curb	5.00	n/a	n/a	9.085	7.601	0.707	14.70	15.15
M2	Curb	5.00	n/a	n/a	7.149	7.601	0.533	10.15	12.90
M3	Curb	5.00	n/a	n/a	2.307	7.601	0.279	8.45	6.10
M4	Curb	5.00	n/a	n/a	3.517	7.601	0.319	10.40	10.60
M5	Curb	5.00	n/a	n/a	6.415	7.601	0.478	9.90	12.40
M6	Curb	5.00	n/a	n/a	4.936	7.601	0.385	11.20	9.35
M7	Curb	5.00	n/a	n/a	5.122	7.601	0.395	9.40	11.45
M8	Curb	5.00	n/a	n/a	6.819	7.601	0.508	12.70	10.55
M9	Curb	5.00	n/a	n/a	6.489	7.601	0.483	13.35	13.05
M10	Curb	5.00	n/a	n/a	10.064	7.601	0.811	15.75	15.65
M11	Curb	5.00	n/a	n/a	5.972	7.601	0.448	12.85	12.95

Cumulative Junction Discharge Computations

Node I.D.	Node Type	Weighted C-Value	Cumulat. Dr.Area (acres)	Cumulat. Tc (min)	Intens. (in/hr)	User Supply Q cfs)	Additional Q in Node (cfs)	Total Disch. (cfs)
L1	Curb	0.550	1.89	26.19	6.88		0.00	7.149
L2	Curb	0.550	1.77	26.06	6.89		0.00	6.709
L3	Curb	0.550	1.87	26.17	6.88		0.00	7.076
L4	Curb	0.550	1.39	25.60	6.94		0.00	5.307
L5	Curb	0.550	1.09	25.15	6.99		0.00	4.191
L6	Curb	0.550	0.60	24.14	7.11		0.00	2.345
L7	Curb	0.550	0.51	23.88	7.14		0.00	2.002
L8	Curb	0.550	0.92	24.85	7.03		0.00	3.555
L9	Curb	0.550	0.83	24.68	7.04		0.00	3.216
L10	Curb	0.550	1.08	25.14	6.99		0.00	4.154
L11	Curb	0.550	0.74	24.48	7.07		0.00	2.876
L12	Curb	0.550	0.87	24.76	7.04		0.00	3.366
L13	Curb	0.550	1.12	25.20	6.99		0.00	4.303
L14	Curb	0.550	1.06	25.10	7.00		0.00	4.079
L15	Curb	0.550	0.54	23.97	7.13		0.00	2.117
L16	Curb	0.550	1.68	25.96	6.90		0.00	6.378
L17	Curb	0.550	0.52	23.91	7.13		0.00	2.040
M1	Curb	0.550	2.42	26.68	6.83		0.00	9.085
M2	Curb	0.550	1.89	26.19	6.88		0.00	7.149
M3	Curb	0.550	0.59	24.11	7.11		0.00	2.307
M4	Curb	0.550	0.91	24.84	7.03		0.00	3.517
M5	Curb	0.550	1.69	25.97	6.90		0.00	6.415
M6	Curb	0.550	1.29	25.46	6.96		0.00	4.936
M7	Curb	0.550	1.34	25.53	6.95		0.00	5.122
M8	Curb	0.550	1.80	26.09	6.89		0.00	6.819
M9	Curb	0.550	1.71	25.99	6.90		0.00	6.489
ML9	BoxMh	0.550	14.68	29.60	6.53		0.00	52.744
ML10	BoxMh	0.550	14.68	29.60	6.53		0.00	52.744
ML11	BoxMh	0.550	16.28	30.02	6.49		0.00	58.135
ML12	BoxMh	0.550	34.18	32.30	6.29		0.00	118.177
ML13	BoxMh	0.550	36.38	32.40	6.28		0.00	125.616
ML14	JctBx	0.550	36.38	32.40	6.28		0.00	125.616
MM1	BoxMh	0.550	4.90	26.85	6.81		0.00	18.345
MM2	BoxMh	0.550	8.79	28.09	6.68		0.00	32.294
MM3	BoxMh	0.550	2.98	26.03	6.90		0.00	11.301
MM4	BoxMh	0.550	3.14	26.10	6.89		0.00	11.894
MM5	BoxMh	0.550	13.64	29.16	6.57		0.00	49.322
MM6	BoxMh	0.550	17.90	31.12	6.39		0.00	62.926
M8	Curb	0.550	1.80	26.09	6.89		0.00	6.819
M9	Curb	0.550	1.71	25.99	6.90		0.00	6.489
M10	Curb	0.550	2.69	26.90	6.80		0.00	10.064
M11	Curb	0.550	1.57	25.83	6.92		0.00	5.972
ML1	BoxMh	0.550	3.66	26.25	6.87		0.00	13.832
ML2	BoxMh	0.550	5.53	26.32	6.86		0.00	20.875
ML3	BoxMh	0.550	2.48	25.66	6.94		0.00	9.459
ML4	BoxMh	0.550	1.11	24.22	7.10		0.00	4.333
ML5	BoxMh	0.550	9.12	27.48	6.74		0.00	33.819
ML6	BoxMh	0.550	1.75	24.92	7.02		0.00	6.754
ML7	BoxMh	0.550	11.95	28.52	6.64		0.00	43.621
ML8	BoxMh	0.550	1.99	25.26	6.98		0.00	7.638
MM7	BoxMh	0.550	17.90	31.12	6.39		0.00	62.926
MM8	BoxMh	0.550	17.90	31.12	6.39		0.00	62.926
OUT	OutIt	0.550	36.38	32.40	6.28		0.00	125.616

Conveyance Configuration Data

Run #	Node US	I.D. DS	FlowLine Elev. US (ft)	DS (ft)	Shape #	Span (ft)	Rise (ft)	Length (ft)	Slope (%)	n_value
1	L1	ML1	42.39	42.19	Cir 1	0.00	2.00	21.0	0.952	0.013
2	L2	ML1	42.39	42.19	Cir 1	0.00	2.00	7.0	2.858	0.013
3	ML1	ML2	42.19	41.99	Cir 1	0.00	2.00	30.0	0.667	0.013
4	L3	ML2	42.65	42.45	Cir 1	0.00	2.00	21.0	0.952	0.013
5	ML2	ML5	41.49	41.11	Cir 1	0.00	2.50	295.0	0.129	0.013
6	L4	ML3	42.27	42.07	Cir 1	0.00	2.00	21.0	0.952	0.013
7	L5	ML3	42.27	42.07	Cir 1	0.00	2.00	7.0	2.858	0.013
8	ML3	ML5	42.07	41.87	Cir 1	0.00	2.00	29.0	0.690	0.013
9	L6	ML4	42.33	42.13	Cir 1	0.00	2.00	21.0	0.952	0.013
10	L7	ML4	42.33	42.13	Cir 1	0.00	2.00	7.0	2.858	0.013
11	ML4	ML5	42.13	41.93	Cir 1	0.00	2.00	43.0	0.465	0.013
12	ML5	ML7	40.61	40.31	Cir 1	0.00	3.00	300.0	0.100	0.013
13	L8	ML6	41.99	41.79	Cir 1	0.00	2.00	21.0	0.952	0.013
14	L9	ML6	41.99	41.79	Cir 1	0.00	2.00	7.0	2.858	0.013
15	ML6	ML7	41.79	41.59	Cir 1	0.00	2.00	29.0	0.690	0.013
16	L10	ML7	42.30	42.10	Cir 1	0.00	2.00	21.0	0.952	0.013
17	ML7	ML9	39.81	39.57	Cir 1	0.00	3.50	292.0	0.082	0.013
18	L11	ML9	42.29	42.09	Cir 1	0.00	2.00	22.0	0.909	0.013
19	L12	ML8	41.98	41.78	Cir 1	0.00	2.00	7.0	2.858	0.013
20	L13	ML8	41.98	41.78	Cir 1	0.00	2.00	21.0	0.952	0.013
21	ML8	ML9	41.78	41.58	Cir 1	0.00	2.00	28.0	0.714	0.013
22	ML9	ML10	39.57	39.49	Cir 1	0.00	3.50	102.0	0.078	0.013
23	ML10	ML11	39.49	39.37	Cir 1	0.00	3.50	139.0	0.086	0.013
24	L14	ML11	42.04	41.84	Cir 1	0.00	2.00	21.0	0.952	0.013
25	L15	ML11	42.04	41.84	Cir 1	0.00	2.00	7.0	2.858	0.013
26	ML11	ML12	39.37	39.34	Cir 1	0.00	3.50	30.0	0.100	0.013
27	M1	MM1	41.89	41.69	Cir 1	0.00	2.00	50.0	0.400	0.013
28	M2	MM1	41.55	41.35	Cir 1	0.00	2.00	7.0	2.858	0.013
29	M3	MM1	41.55	41.35	Cir 1	0.00	2.00	21.0	0.952	0.013
30	MM1	MM2	39.29	38.93	Cir 1	0.00	2.50	278.0	0.129	0.013
31	M4	MM2	41.71	41.51	Cir 1	0.00	2.00	21.0	0.952	0.013
32	M5	MM3	41.47	41.27	Cir 1	0.00	2.00	21.0	0.952	0.013
33	M6	MM3	41.47	41.27	Cir 1	0.00	2.00	7.0	2.858	0.013
34	MM3	MM2	41.27	41.07	Cir 1	0.00	2.00	30.0	0.667	0.013
35	MM2	MM5	38.43	38.14	Cir 1	0.00	3.00	293.0	0.099	0.013
36	M7	MM4	41.30	41.10	Cir 1	0.00	2.00	21.0	0.952	0.013
37	M8	MM4	41.30	41.10	Cir 1	0.00	2.00	7.0	2.858	0.013
38	MM4	MM5	41.10	40.90	Cir 1	0.00	2.00	29.0	0.690	0.013
39	M9	MM5	41.51	41.31	Cir 1	0.00	2.00	22.0	0.909	0.013
40	MM5	MM6	37.64	37.15	Cir 1	0.00	3.50	601.0	0.082	0.013
41	M10	MM6	41.61	41.41	Cir 1	0.00	2.00	21.0	0.952	0.013
42	M11	MM6	41.61	41.41	Cir 1	0.00	2.00	7.0	2.858	0.013
43	MM6	MM7	37.15	37.11	Cir 1	0.00	3.50	42.0	0.095	0.013
44	MM8	ML12	37.07	36.79	Cir 1	0.00	4.00	356.0	0.079	0.013
45	ML12	ML13	36.29	36.25	Cir 1	0.00	4.50	43.0	0.093	0.013
46	L16	ML13	42.04	41.84	Cir 1	0.00	2.00	14.0	1.429	0.013
47	L17	ML13	42.04	41.84	Cir 1	0.00	2.00	14.0	1.429	0.013
48	ML13	ML14	34.25	34.13	Cir 1	0.00	4.50	99.0	0.121	0.013
49	ML14	OUT	32.29	31.97	Box 1	4.00	3.00	77.0	0.416	0.015
50	MM7	MM8	37.11	37.07	Cir 1	0.00	3.50	39.0	0.103	0.013

Conveyance Hydraulic Computations. Tailwater = 42.470 (ft)

Run #	Hyd. Gr.line US (ft)	DS (ft)	Crit.Elev US (ft)	Fr.Slope (%)	Depth Unif. (ft)	Depth Actual (ft)	Velocity Unif. (f/s)	Velocity Actual (f/s)	Q (cfs)	Cap (cfs)	Junc Loss (ft)
1*	47.04	47.01	47.89	0.099	0.78	2.00	6.27	4.87	7.1	22.2	0.000
2*	47.02	47.01	47.89	0.087	0.57	2.00	9.16	4.77	6.7	38.4	0.000
3*	47.01	46.90	47.89	0.371	1.29	2.00	6.45	6.18	13.8	18.6	0.000
4*	46.92	46.90	47.89	0.097	0.78	2.00	6.26	4.85	7.1	22.2	0.000
5	46.90	46.15	47.89	0.257	2.50	2.50	4.25	4.25	20.9	14.8	0.000
6*	46.21	46.20	47.63	0.055	0.67	2.00	5.78	4.43	5.3	22.2	0.000
7*	46.20	46.20	47.63	0.034	0.45	2.00	8.00	4.13	4.2	38.4	0.000
8*	46.20	46.15	47.63	0.173	1.00	2.00	5.99	5.35	9.5	18.9	0.000
9*	46.16	46.16	47.63	0.011	0.44	2.00	4.57	3.50	2.3	22.2	0.000
10*	46.16	46.16	47.63	0.008	0.31	2.00	6.43	3.34	2.0	38.4	0.000
11*	46.16	46.15	47.63	0.036	0.72	2.00	4.22	4.17	4.3	15.5	0.000
12	46.15	45.38	47.63	0.255	3.00	3.00	4.78	4.78	33.8	21.2	0.000
13*	45.41	45.41	47.56	0.024	0.54	2.00	5.16	3.95	3.6	22.2	0.000
14*	45.41	45.41	47.56	0.020	0.39	2.00	7.40	3.83	3.2	38.4	0.000
15*	45.41	45.38	47.56	0.088	0.83	2.00	5.49	4.78	6.8	18.9	0.000
16*	45.39	45.38	47.56	0.033	0.59	2.00	5.39	4.12	4.2	22.2	0.000
17	45.38	44.84	47.56	0.186	3.50	3.50	4.53	4.53	43.6	29.0	0.000
18*	44.84	44.84	47.92	0.016	0.49	2.00	4.78	3.71	2.9	21.7	0.000
19*	44.87	44.87	47.92	0.022	0.40	2.00	7.50	3.87	3.4	38.4	0.000
20*	44.88	44.87	47.92	0.036	0.60	2.00	5.45	4.16	4.3	22.2	0.000
21*	44.87	44.84	47.92	0.113	0.88	2.00	5.75	4.97	7.6	19.2	0.000
22	44.84	44.56	47.92	0.273	3.50	3.50	5.48	5.48	52.7	28.3	0.000
23	44.56	44.18	48.91	0.273	3.50	3.50	5.48	5.48	52.7	29.7	0.000
24*	44.19	44.18	48.03	0.032	0.58	2.00	5.37	4.10	4.1	22.2	0.000
25*	44.18	44.18	48.03	0.009	0.32	2.00	6.54	3.40	2.1	38.4	0.000
26	44.18	44.08	48.03	0.331	3.50	3.50	6.04	6.04	58.1	32.0	0.000
27	47.86	47.74	48.00	0.160	1.16	2.00	4.83	2.89	9.1	14.4	0.000
28*	47.74	47.74	48.00	0.099	0.59	2.00	9.32	4.87	7.1	38.4	0.000
29*	47.74	47.74	48.00	0.010	0.44	2.00	4.55	3.47	2.3	22.2	0.000
30	47.74	47.19	48.00	0.198	2.50	2.50	3.74	3.74	18.3	14.8	0.000
31*	47.19	47.19	47.61	0.024	0.54	2.00	5.14	3.92	3.5	22.2	0.000
32*	47.28	47.26	47.61	0.080	0.74	2.00	6.09	4.70	6.4	22.2	0.000
33*	47.26	47.26	47.61	0.047	0.49	2.00	8.38	4.33	4.9	38.4	0.000
34*	47.26	47.19	47.61	0.247	1.13	2.00	6.18	5.71	11.3	18.6	0.000
35	47.19	46.50	47.61	0.232	3.00	3.00	4.57	4.57	32.3	21.1	0.000
36*	46.59	46.58	47.35	0.051	0.66	2.00	5.72	4.38	5.1	22.2	0.000
37*	46.59	46.58	47.35	0.090	0.57	2.00	9.20	4.79	6.8	38.4	0.000
38*	46.58	46.50	47.35	0.274	1.16	2.00	6.33	5.82	11.9	18.9	0.000
39*	46.52	46.50	47.35	0.082	0.75	2.00	6.01	4.72	6.5	21.7	0.000
40	46.50	45.07	47.35	0.238	3.50	3.50	5.13	5.13	49.3	28.9	0.000
41*	45.11	45.07	48.25	0.196	0.95	2.00	6.86	5.47	10.1	22.2	0.000
42*	45.08	45.07	48.25	0.069	0.53	2.00	8.86	4.59	6.0	38.4	0.000
43	45.07	44.91	48.25	0.388	3.50	3.50	6.54	6.54	62.9	31.2	0.000
44	44.76	44.08	48.20	0.190	4.00	4.00	5.01	5.01	62.9	40.5	0.000
45	44.08	43.93	48.03	0.358	4.50	4.50	7.43	7.43	118.2	60.2	0.000
46*	43.94	43.93	48.03	0.079	0.66	2.00	7.04	4.69	6.4	27.2	0.000
47*	43.93	43.93	48.03	0.008	0.37	2.00	5.07	3.38	2.0	27.2	0.000
48	43.93	43.53	48.03	0.405	4.50	4.50	7.90	7.90	125.6	68.8	0.000
49*	43.53	42.47	48.06	1.371	3.00	3.00	10.47	10.47	125.6	69.2	0.000
50	44.91	44.76	48.20	0.388	3.50	3.50	6.54	6.54	62.9	32.4	0.000

* Supercritical flow.

SUMMARY OF STORM DRAIN STRUCTURE QUANTITIES

NOTE:
The convey'length should be from upstream to downstream inside box.
This length may also be used as Pay Item.
Using hydraulic length, from node center to node center, may result in profile error,
and this length should not be used as Pay Item.

LINKS:

Type of Convey Structure	Material	Rise (ft)	Span (ft)	Number of Links of this type	Quantity (ft)
Circular	Concrete	2.0	0.0	35	683.0
Circular	Concrete	2.5	0.0	2	573.0
Circular	Concrete	3.0	0.0	2	593.0
Circular	Concrete	3.5	0.0	7	1245.0
Circular	Concrete	4.0	0.0	1	356.0
Circular	Concrete	4.5	0.0	2	142.0
Box	Concrete	3.0	4.0	1	77.0

NODES:

Type of Inlet Structure	Type of Grate	Inlet Length (ft)	Grate Width (ft)	Grate Length (ft)	Grate Area (ft)	Grate Perimeter (ft)	Quantity (each)
Curb In Sag		5.0	0.0	0.0	0.0	0.0	28
Box Manhole		0.0	0.0	0.0	0.0	0.0	21
Junction Box		0.0	0.0	0.0	0.0	0.0	1
Outlet		0.0	0.0	0.0	0.0	0.0	1

END

NORMAL TERMINATION OF HOUSTORM.

Warning Messages for current project:

Runoff Frequency of: 100 Years
Discharge decreased downstream node Id= ML10 Previous intensity used.
Discharge decreased downstream node Id= MM7 Previous intensity used.
Discharge decreased downstream node Id= MM8 Previous intens

HouStorm (City Of Houston STORM DRAIN DESIGN) Version 2.1, Update:
Nov/01/2007

Run @ 6/17/2010 2:56:08 PM

PROJECT NAME : NSR 446A
JOB NUMBER : 09-051
PROJECT DESCRIPTION : Cloverdale Proposed System (100-Year)
PROJECT File: X:\09-051 - Houston - NSR 446a\Design\Design Data\HouStorm\FINAL DESIGN\Proposed Systems\100-Year\Text Files\Cloverdale-100yr.txt

ANALYSYS FREQUENCY : 100 Years
MEASUREMENT UNITS: ENGLISH

OUTPUT FOR ANALYSYS FREQUENCY of: 100 Years

Runoff Computation for Design Frequency.

ID	C Value	Area (acre)	Tc (min)	Tc Used (min)	Intensity (in/hr)	Supply Q (cfs)	Total Q (cfs)
C1	0.55	1.31	25.49	25.49	6.95	0.000	5.010
C2	0.55	1.10	25.17	25.17	6.99	0.000	4.229
C3	0.55	1.15	25.25	25.25	6.98	0.000	4.415
C4	0.55	2.34	26.61	26.61	6.83	0.000	8.794
C5	0.55	1.66	25.93	25.93	6.91	0.000	6.305
C6	0.55	1.16	25.26	25.26	6.98	0.000	4.453
C7	0.55	1.06	25.10	25.10	7.00	0.000	4.079
C8	0.55	1.16	25.26	25.26	6.98	0.000	4.453
C9	0.55	1.70	25.98	25.98	6.90	0.000	6.452
C10	0.55	1.30	25.47	25.47	6.96	0.000	4.974

On Grade Inlet Configuration Data

Inlet ID	Inlet Type	Inlet Length (ft)	Slopes Long (%)	Slopes Trans (%)	Gutter n	Gutter Depr. (ft)	Grate Width (ft)	Grate Type	Pond Width Allowed (ft)
C6	Curb	5.00	0.30	2.00	0.014	0.33	n/a	n/a	13.50
C7	Curb	5.00	0.30	2.00	0.014	0.33	n/a	n/a	13.50

On Grade Inlets Computation Data.

Inlet ID	Inlet Type	Total Q (cfs)	Intercept Capacity (cfs)	Q Bypass Allow (cfs)	Q Bypass Actual (cfs)	To Inlet ID	Required Length (ft)	Actual Length (ft)	Ponded Width (ft)
C6	Curb	4.453	3.342	1.000	1.111	C8	9.30	5.00	15.05
C7	Curb	4.079	3.177	1.000	0.903	C9	8.81	5.00	14.55

Sag Inlets Configuration Data.

Inlet ID	Inlet Type	Length/ Perim (ft)	Grate Area (sf)	Left-Slope Longi (%)	Left-Slope Transv (%)	Right-Slope Longi (%)	Right-Slope Transv (%)	n	Gutter DeprW (ft)	Head Allowed (ft)
C1	Curb	5.00	0.00	2.05	2.00	0.30	2.00	0.014	1.50	0.57
C2	Curb	5.00	0.00	0.30	2.00	2.86	2.00	0.014	1.50	0.57
C3	Curb	5.00	0.00	0.45	2.00	1.16	2.00	0.014	1.50	0.57
C4	Curb	5.00	0.00	0.33	2.00	0.33	2.00	0.014	1.50	0.57
C5	Curb	5.00	0.00	1.93	2.00	0.31	2.00	0.014	1.50	0.57
C8	Curb	5.00	0.00	0.30	2.00	1.35	2.00	0.014	1.50	0.57
C9	Curb	5.00	0.00	1.35	2.00	0.30	2.00	0.014	1.50	0.57
C10	Curb	5.00	0.00	0.30	2.00	0.30	2.00	0.014	1.50	0.57

Sag Inlets Computation Data.

Inlet ID	Inlet Type	Length (ft)	Grate Perim (ft)	Grate Area (sf)	Total Q (cfs)	Inlet Capacity (cfs)	Actual Head (ft)	Ponded Left (ft)	Width Right (ft)
C1	Curb	5.00	n/a	n/a	5.010	7.601	0.389	8.45	12.10
C2	Curb	5.00	n/a	n/a	4.229	7.601	0.349	11.40	7.45
C3	Curb	5.00	n/a	n/a	4.415	7.601	0.358	10.70	8.95
C4	Curb	5.00	n/a	n/a	8.794	7.601	0.678	14.70	14.70
C5	Curb	5.00	n/a	n/a	6.305	7.601	0.470	9.30	13.15
C8	Curb	5.00	n/a	n/a	5.563	7.601	0.421	12.60	9.50
C9	Curb	5.00	n/a	n/a	7.354	7.601	0.550	10.55	14.00
C10	Curb	5.00	n/a	n/a	4.974	7.601	0.387	12.10	12.10

Cumulative Junction Discharge Computations

Node I.D.	Node Type	Weighted C-Value	Cumulat. Dr.Area (acres)	Cumulat. Tc (min)	Intens. (in/hr)	User Supply Q cfs)	Additional Q in Node (cfs)	Total Disch. (cfs)
C1	Curb	0.550	1.31	25.49	6.95		0.00	5.010
C2	Curb	0.550	1.10	25.17	6.99		0.00	4.229
C3	Curb	0.550	1.15	25.25	6.98		0.00	4.415
C4	Curb	0.550	2.34	26.61	6.83		0.00	8.794
C5	Curb	0.550	4.00	26.69	6.82		0.00	15.014
C6	Curb	0.550	1.16	25.26	6.98		0.00	4.453
C7	Curb	0.550	1.06	25.10	7.00		0.00	4.079
C8	Curb	0.550	1.16	25.26	6.98		0.00	4.453
C9	Curb	0.550	1.70	25.98	6.90		0.00	6.452
C10	Curb	0.550	1.30	25.47	6.96		0.00	4.974
MC1	BoxMh	0.550	2.41	25.55	6.95		0.00	9.208
MC2	BoxMh	0.550	2.41	25.55	6.95		0.00	9.208
MC3	BoxMh	0.550	3.56	26.79	6.81		0.00	13.342
MC4	BoxMh	0.550	7.56	26.89	6.80		0.00	28.286
MC5	BoxMh	0.550	7.56	26.89	6.80		0.00	28.286
MC6	BoxMh	0.550	7.56	26.89	6.80		0.00	28.286
MC7	BoxMh	0.550	7.56	26.89	6.80		0.00	28.286
MC8	BoxMh	0.550	9.78	27.66	6.72		0.00	36.169
MC9	BoxMh	0.550	12.64	28.69	6.62		0.00	46.025
MC10	BoxMh	0.550	13.94	28.80	6.61		0.00	50.676
OUT	Outlt	0.550	13.94	28.80	6.61		0.00	50.676

Conveyance Configuration Data

Run #	Node US	Node DS	FlowLine Elev. US (ft)	FlowLine Elev. DS (ft)	Shape #	Span (ft)	Rise (ft)	Length (ft)	Slope (%)	n_value
1	C1	MC1	43.11	42.91	Cir 1	0.00	2.00	21.0	0.952	0.013
2	C2	MC1	43.11	42.91	Cir 1	0.00	2.00	7.0	2.858	0.013
3	MC1	MC2	42.91	42.71	Cir 1	0.00	2.00	28.0	0.714	0.013
4	MC2	MC3	40.90	40.44	Cir 1	0.00	2.00	257.0	0.179	0.013
5	C3	MC3	43.21	43.01	Cir 1	0.00	2.00	7.0	2.858	0.013
6	MC3	MC4	40.44	40.36	Cir 1	0.00	2.00	27.0	0.296	0.013
7	C4	C5	42.99	42.79	Cir 1	0.00	2.00	28.0	0.714	0.013
8	C5	MC4	42.79	42.59	Cir 1	0.00	2.00	46.0	0.435	0.013
9	MC4	MC5	39.86	39.76	Cir 1	0.00	2.50	79.0	0.127	0.013
10	MC5	MC6	39.76	39.60	Cir 1	0.00	2.50	121.0	0.132	0.013
11	MC6	MC7	39.60	39.50	Cir 1	0.00	2.50	74.0	0.135	0.013
12	MC7	MC8	39.50	39.16	Cir 1	0.00	2.50	263.0	0.129	0.013
13	C6	MC8	43.05	42.85	Cir 1	0.00	2.00	7.0	2.858	0.013
14	C7	MC8	43.05	42.85	Cir 1	0.00	2.00	21.0	0.952	0.013
15	MC8	MC9	38.66	38.34	Cir 1	0.00	3.00	318.0	0.101	0.013
16	C8	MC9	42.08	41.88	Cir 1	0.00	2.00	7.0	2.858	0.013
17	C9	MC9	42.08	41.88	Cir 1	0.00	2.00	21.0	0.952	0.013
18	MC9	MC10	38.34	38.29	Cir 1	0.00	3.00	43.0	0.116	0.013
19	C10	MC10	42.34	42.14	Cir 1	0.00	2.00	7.0	2.858	0.013
20	MC10	OUT	37.79	37.59	Cir 1	0.00	3.50	247.0	0.081	0.013

Conveyance Hydraulic Computations. Tailwater = 43.090 (ft)

Run #	Hyd. No.	Gr.line US (ft)	Gr.line DS (ft)	Crit.Elev US (ft)	Fr.Slope (%)	Depth Unif. (ft)	Depth Actual (ft)	Velocity Unif. (f/s)	Velocity Actual (f/s)	Q (cfs)	Cap (cfs)	Junc Loss (ft)
1*	47	47.56	47.55	48.72	0.049	0.65	2.00	5.69	4.35	5.0	22.2	0.000
2*	46	47.55	47.55	48.72	0.035	0.45	2.00	8.02	4.14	4.2	38.4	0.000
3*	45	47.55	47.50	48.72	0.164	0.98	2.00	6.03	5.30	9.2	19.2	0.000
4	44	47.50	47.47	48.72	0.164	1.58	2.00	3.46	2.93	9.2	9.6	0.000
5*	43	47.47	47.47	48.95	0.038	0.46	2.00	8.12	4.19	4.4	38.4	0.000
6	42	47.47	47.37	48.95	0.345	2.00	2.00	4.25	4.25	13.3	12.4	0.000
7*	41	47.62	47.57	48.95	0.150	0.95	2.00	5.96	5.21	8.8	19.2	0.000
8	40	47.57	47.37	48.95	0.437	1.65	2.00	5.41	4.78	15.0	15.0	0.000
9	39	47.37	47.00	48.95	0.472	2.50	2.50	5.76	5.76	28.3	14.7	0.000
10	38	47.00	46.43	49.46	0.472	2.50	2.50	5.76	5.76	28.3	15.0	0.000
11	37	46.43	46.08	49.77	0.472	2.50	2.50	5.76	5.76	28.3	15.1	0.000
12	36	46.08	44.84	49.70	0.472	2.50	2.50	5.76	5.76	28.3	14.8	0.000
13*	35	44.84	44.84	49.00	0.038	0.46	1.99	8.14	4.20	4.5	38.4	0.000
14*	34	44.85	44.84	49.00	0.032	0.58	1.99	5.37	4.10	4.1	22.2	0.000
15	33	44.84	43.91	49.00	0.292	3.00	3.00	5.12	5.12	36.2	21.2	0.000
16*	32	43.92	43.91	49.15	0.038	0.46	2.00	8.14	4.20	4.5	38.4	0.000
17*	31	43.93	43.91	49.15	0.081	0.74	2.00	6.10	4.71	6.5	22.2	0.000
18	30	43.91	43.71	49.15	0.472	3.00	3.00	6.51	6.51	46.0	22.8	0.000
19*	29	43.71	43.71	49.15	0.048	0.49	1.57	8.40	4.34	5.0	38.4	0.000
20	28	43.71	43.09	49.15	0.252	3.50	3.50	5.27	5.27	50.7	28.8	0.000

* Supercritical flow.

SUMMARY OF STORM DRAIN STRUCTURE QUANTITIES

NOTE:
The convey length should be from upstream to downstream inside box.
This length may also be used as Pay Item.
Using hydraulic length, from node center to node center, may result in profile error,
and this length should not be used as Pay Item.

LINKS:

Type of Convey Structure	Material	Rise (ft)	Span (ft)	Number of Links of this type	Quantity (ft)
Circular	Concrete	2.0	0.0	13	484.0
Circular	Concrete	2.5	0.0	4	537.0
Circular	Concrete	3.0	0.0	2	361.0
Circular	Concrete	3.5	0.0	1	247.0

NODES:

Type of Inlet Structure	Type of Grate	Inlet Length (ft)	Grate Width (ft)	Grate Length (ft)	Grate Area (ft)	Grate Perimeter (ft)	Quantity (each)
Curb In Sag		5.0	0.0	0.0	0.0	0.0	8
Curb On Grade		5.0	0.0	0.0	0.0	0.0	2
Box Manhole		0.0	0.0	0.0	0.0	0.0	10
Outlet		0.0	0.0	0.0	0.0	0.0	1

NORMAL TERMINATION OF HOUSTORM.

Warning Messages for current project:

Runoff Frequency of: 100 Years
Discharge decreased downstream node Id= MC2 Previous intensity used.
Discharge decreased downstream node Id= MC5 Previous intensity used.
Discharge decreased downstream node Id= MC6 Previous intensity used.
Discharge decreased downstream node Id= MC7 Previous intensity used.
Capacity of grade inlet exceeded at inlet Id= C6
Computed ponded width exceeds allowable width at inlet Id= C6
Capacity of grade inlet exceeded at inlet Id= C7
Computed ponded width exceeds allowable width at inlet Id= C7
Computed right ponded width exceeds allowable width at inlet Id= C4
Computed left ponded width exceeds allowable width at inlet Id= C4
Capacity of sag inlet exceeded at inlet Id= C4
Computed right ponded width exceeds allowable width at inlet Id= C9
Run# 20 Insufficient capacity.
Run# 18 Insufficient capacity.
Run# 15 Insufficient capacity.
Run# 12 Insufficient capacity.
Run# 11 Insufficient capacity.
Run# 10 Insufficient capacity.
Run# 9 Insufficient capacity.
Run# 6 Insufficient capacity.
Run# 8 Insufficient capacity.

HouStorm (City of Houston STORM DRAIN DESIGN) Version 2.1, Update:
Nov/01/2007

Run @ 8/24/2010 11:10:52 AM

PROJECT NAME : NSR 446A
JOB NUMBER : 09-051
PROJECT DESCRIPTION : Durhill Proposed System (100-Year)
PROJECT File: X:\09-051 - Houston - NSR 446a\Design\Design Data\HouStorm\FINAL DESIGN\Proposed Systems\100-Year\Text Files\Durhill-100yr.txt

ANALYSYS FREQUENCY : 100 Years
MEASUREMENT UNITS: ENGLISH

OUTPUT FOR ANALYSYS FREQUENCY of: 100 Years

Runoff Computation for Design Frequency.

ID	C Value	Area (acre)	Tc (min)	Tc Used (min)	Intensity (in/hr)	Supply Q (cfs)	Total Q (cfs)
D8	0.55	0.82	24.66	24.66	7.05	0.000	3.178
D9	0.55	1.19	25.31	25.31	6.97	0.000	4.564
D10	0.55	1.58	25.84	25.84	6.92	0.000	6.010
D11	0.55	1.32	25.50	25.50	6.95	0.000	5.048
D12	0.55	1.13	25.22	25.22	6.98	0.000	4.340
D1	0.55	1.11	25.19	25.19	6.99	0.000	4.266
D2	0.55	1.04	25.07	25.07	7.00	0.000	4.004
D3	0.55	1.46	25.69	25.69	6.93	0.000	5.566
D4	0.55	2.88	27.05	27.05	6.79	0.000	10.750
D5	0.55	0.78	24.57	24.57	7.06	0.000	3.027
D6	0.55	2.25	26.54	26.54	6.84	0.000	8.465
D7	0.55	0.90	24.82	24.82	7.03	0.000	3.479

On Grade Inlet Configuration Data

Inlet ID	Inlet Type	Inlet Length (ft)	Slopes Long (%)	Slopes Trans (%)	Gutter n	Gutter Depr. (ft)	Grate Width (ft)	Grate Type	Pond Width Allowed (ft)
D11	Curb	5.00	0.33	2.00	0.014	0.33	n/a	n/a	13.50
D12	Curb	5.00	0.33	2.00	0.014	0.33	n/a	n/a	13.50
D8	Curb	5.00	0.30	2.00	0.014	0.33	n/a	n/a	13.00

On Grade Inlets Computation Data.

Inlet ID	Inlet Type	Total Q (cfs)	Intercept Capacity (cfs)	Q Bypass Allow (cfs)	Q Bypass Actual (cfs)	To Inlet ID	Required Length (ft)	Actual Length (ft)	Ponded Width (ft)
D11	Curb	5.048	3.536	1.000	1.511	D9	10.24	5.00	15.50
D12	Curb	4.340	3.248	1.000	1.092	D10	9.34	5.00	14.65
D8	Curb	3.178	2.723	1.000	0.455	D7	7.57	5.00	13.25

Sag Inlets Configuration Data.

Inlet ID	Inlet Type	Length/ Perim (ft)	Grate Area (sf)	Left-Slope Longi (%)	Left-Slope Transv (%)	Right-Slope Longi (%)	Right-Slope Transv (%)	n	Gutter DeprW (ft)	Head Allowed (ft)
D1	Curb	5.00	0.00	2.51	2.00	0.70	2.00	0.014	1.50	0.57
D2	Curb	5.00	0.00	0.70	2.00	2.24	2.00	0.014	1.50	0.57
D3	Curb	5.00	0.00	0.30	2.00	0.44	2.00	0.014	1.50	0.57
D4	Curb	8.00	0.00	2.01	2.00	0.30	2.00	0.014	1.50	0.57
D5	Curb	5.00	0.00	1.00	2.00	1.33	2.00	0.014	1.50	0.57
D6	Curb	8.00	0.00	0.30	2.00	1.16	2.00	0.014	1.50	0.57
D7	Curb	5.00	0.00	1.33	2.00	1.85	2.00	0.014	1.50	0.57
D9	Curb	5.00	0.00	0.33	2.00	1.00	2.00	0.014	1.50	0.57
D10	Curb	5.00	0.00	1.70	2.00	0.33	2.00	0.014	1.50	0.57

Sag Inlets Computation Data.

Inlet ID	Inlet Type	Length (ft)	Grate Perim (ft)	Grate Area (sf)	Total Q (cfs)	Inlet Capacity (cfs)	Actual Head (ft)	Ponded Left (ft)	Width Right (ft)
D1	Curb	5.00	n/a	n/a	4.266	7.601	0.351	7.65	9.75
D2	Curb	5.00	n/a	n/a	4.004	7.601	0.339	9.50	7.65
D3	Curb	5.00	n/a	n/a	5.566	7.601	0.422	12.60	11.75
D4	Curb	8.00	n/a	n/a	10.750	10.591	0.576	11.30	16.15
D5	Curb	5.00	n/a	n/a	3.027	7.601	0.301	8.00	7.60
D6	Curb	8.00	n/a	n/a	8.465	10.591	0.491	14.75	11.45
D7	Curb	5.00	n/a	n/a	3.935	7.601	0.336	8.40	7.85
D9	Curb	5.00	n/a	n/a	6.075	7.601	0.454	12.80	10.40
D10	Curb	5.00	n/a	n/a	7.102	7.601	0.529	10.00	13.55

Cumulative Junction Discharge Computations

Node I.D.	Node Type	Weighted C-Value	Cumulat. Dr.Area (acres)	Cumulat. Tc (min)	Intens. (in/hr)	User Supply Q cfs)	Additional Q in Node (cfs)	Total Disch. (cfs)
D11	Curb	0.550	1.32	25.50	6.95		0.00	5.048
D12	Curb	0.550	1.13	25.22	6.98		0.00	4.340
MD1	BoxMh	0.550	2.15	25.20	6.99		0.00	8.260
MD2	BoxMh	0.550	3.61	25.75	6.92		0.00	13.749
MD3	BoxMh	0.550	3.61	25.75	6.92		0.00	13.749
MD4	BoxMh	0.550	14.78	28.47	6.64		0.00	53.999
MD5	BoxMh	0.550	16.46	28.55	6.63		0.00	60.059
MD6	BoxMh	0.550	8.29	28.30	6.66		0.00	30.363
MD7	BoxMh	0.550	6.04	27.52	6.74		0.00	22.382
MD8	BoxMh	0.550	5.22	27.33	6.76		0.00	19.401
MD9	BoxMh	0.550	5.22	27.33	6.76		0.00	19.401
MD10	BoxMh	0.550	2.45	25.51	6.95		0.00	9.367
D1	Curb	0.550	1.11	25.19	6.99		0.00	4.266
D2	Curb	0.550	1.04	25.07	7.00		0.00	4.004
D3	Curb	0.550	1.46	25.69	6.93		0.00	5.566
D4	Curb	0.550	2.88	27.05	6.79		0.00	10.750
D5	Curb	0.550	0.78	24.57	7.06		0.00	3.027
D6	Curb	0.550	2.25	26.54	6.84		0.00	8.465
D7	Curb	0.550	0.90	24.82	7.03		0.00	3.479
D8	Curb	0.550	0.82	24.66	7.05		0.00	3.178
D9	Curb	0.550	1.19	25.31	6.97		0.00	4.564
D10	Curb	0.550	1.58	25.84	6.92		0.00	6.010
OUT	Outlt	0.550	16.46	28.55	6.63		0.00	60.059

Conveyance Configuration Data

Run #	Node US	Node DS	FlowLine Elev. US (ft)	FlowLine Elev. DS (ft)	Shape #	Span (ft)	Rise (ft)	Length (ft)	Slope (%)	n_value
1	D1	MD1	42.16	41.96	Cir 1	0.00	2.00	7.0	2.858	0.013
2	D2	MD1	42.16	41.96	Cir 1	0.00	2.00	21.0	0.952	0.013
3	MD1	MD2	41.96	41.76	Cir 1	0.00	2.00	28.0	0.714	0.013
4	D3	MD2	42.68	42.48	Cir 1	0.00	2.00	22.0	0.909	0.013
5	MD2	MD3	40.32	39.92	Cir 1	0.00	2.00	202.0	0.198	0.013
6	MD3	MD4	38.92	37.49	Cir 1	0.00	2.00	564.0	0.254	0.013
7	D4	MD4	41.11	40.91	Cir 1	0.00	2.00	35.0	0.571	0.013
8	D12	MD10	43.07	42.87	Cir 1	0.00	2.00	21.0	0.952	0.013
9	D11	MD10	43.07	42.87	Cir 1	0.00	2.00	7.0	2.858	0.013
10	MD10	MD9	42.29	41.59	Cir 1	0.00	2.00	382.0	0.183	0.013
11	D10	MD9	41.79	41.59	Cir 1	0.00	2.00	21.0	0.952	0.013
12	D9	MD9	41.79	41.59	Cir 1	0.00	2.00	7.0	2.858	0.013
13	MD9	MD8	41.09	41.03	Cir 1	0.00	2.50	42.0	0.143	0.013
14	MD8	MD7	39.78	39.72	Cir 1	0.00	2.50	46.0	0.130	0.013
15	D8	MD7	41.98	41.78	Cir 1	0.00	2.00	7.0	2.858	0.013
16	MD7	MD6	38.87	38.59	Cir 1	0.00	2.50	212.0	0.132	0.013
17	D6	MD6	41.33	41.13	Cir 1	0.00	2.00	21.0	0.952	0.013
18	MD6	MD4	36.84	36.79	Cir 1	0.00	3.00	43.0	0.116	0.013
19	MD4	MD5	34.79	34.76	Cir 1	0.00	3.50	29.0	0.103	0.013
20	D5	MD5	40.85	40.65	Cir 1	0.00	2.00	7.0	2.858	0.013
21	D7	MD5	40.85	40.65	Cir 1	0.00	2.00	21.0	0.952	0.013
22	MD5	OUT	34.76	34.59	Cir 1	0.00	3.50	176.0	0.097	0.013

Conveyance Hydraulic Computations. Tailwater = 41.320 (ft)

Run #	Hyd. No.	Gr.line US (ft)	Gr.line DS (ft)	Crit.Elev US (ft)	Fr.Slope (%)	Depth Unif. (ft)	Depth Actual (ft)	Velocity Unif. (f/s)	Velocity Actual (f/s)	Q (cfs)	Cap (cfs)	Junc Loss (ft)
1*	44	44.87	44.87	48.16	0.035	0.45	2.00	8.04	4.15	4.3	38.4	0.000
2*	43	44.87	44.87	48.16	0.031	0.58	2.00	5.34	4.07	4.0	22.2	0.000
3*	44	44.87	44.83	48.16	0.132	0.92	2.00	5.86	5.10	8.3	19.2	0.000
4*	45	44.84	44.83	48.16	0.060	0.69	2.00	5.76	4.49	5.6	21.7	0.000
5	46	44.83	44.09	48.16	0.366	2.00	2.00	4.38	4.38	13.7	10.1	0.000
6	47	44.09	42.02	48.89	0.366	2.00	2.00	4.38	4.38	13.7	11.4	0.000
7*	48	42.26	42.02	47.13	0.224	1.15	1.15	5.75	5.75	10.7	17.2	0.000
8*	49	43.88	43.88	49.40	0.036	0.60	1.01	5.46	4.17	4.3	22.2	0.000
9*	50	43.88	43.88	49.40	0.049	0.49	1.01	8.44	4.36	5.0	38.4	0.000
10	51	43.88	43.08	49.40	0.170	1.59	1.59	3.51	3.51	9.4	9.7	0.000
11*	52	43.09	43.08	47.73	0.070	0.71	1.49	5.98	4.60	6.0	22.2	0.000
12*	53	43.08	43.08	47.73	0.040	0.47	1.49	8.20	4.23	4.6	38.4	0.000
13	54	43.08	42.84	47.73	0.222	2.50	2.50	3.95	3.95	19.4	15.6	0.000
14	55	42.84	42.74	47.73	0.222	2.50	2.50	3.95	3.95	19.4	14.9	0.000
15*	56	42.74	42.74	48.46	0.020	0.39	0.96	7.37	3.81	3.2	38.4	0.000
16	57	42.74	42.11	48.46	0.295	2.50	2.50	4.56	4.56	22.4	15.0	0.000
17*	58	42.19	42.11	47.13	0.139	0.86	0.98	6.56	5.51	8.5	22.2	0.000
18	59	42.11	42.02	47.13	0.205	3.00	3.00	4.30	4.30	30.4	22.8	0.000
19	60	42.02	41.94	47.13	0.286	3.50	3.50	5.61	5.61	54.0	32.5	0.000
20*	61	41.94	41.94	47.13	0.018	0.38	1.29	7.27	3.75	3.0	38.4	0.000
21*	62	41.95	41.94	47.13	0.023	0.54	1.29	5.13	3.89	3.5	22.2	0.000
22	63	41.94	41.32	47.13	0.353	3.50	3.50	6.24	6.24	60.1	31.4	0.000

* Supercritical flow.

SUMMARY OF STORM DRAIN STRUCTURE QUANTITIES

NOTE:
The convey length should be from upstream to downstream inside box.
This length may also be used as Pay Item.
Using hydraulic length, from node center to node center, may result in profile error,
and this length should not be used as Pay Item.

LINKS:

Type of Convey Structure	Material	Rise (ft)	Span (ft)	Number of Links of this type	Quantity (ft)
Circular	Concrete	2.0	0.0	16	1373.0
Circular	Concrete	2.5	0.0	3	300.0
Circular	Concrete	3.0	0.0	1	43.0
Circular	Concrete	3.5	0.0	2	205.0

NODES:

Type of Inlet Structure	Type of Grate	Inlet Length (ft)	Grate Width (ft)	Grate Length (ft)	Grate Area (ft)	Grate Perimeter (ft)	Quantity (each)
Curb On Grade		5.0	0.0	0.0	0

NOTES:

1. ALL ELEVATIONS SHOWN IN HOUSTORM CALCULATIONS ARE IN TSARP DATUM (1988 DATUM, 2001 ADJ.). SURVEY AND PLAN ELEVATIONS ARE IN NSRS (CORS) DATUM; EQUATION TO TIE FROM NSRS (CORS) DATUM TO TSARP DATUM IS: TSARP EL. (ft) = NSRS EL. (ft) – 0.21

NSR 446A
HOUSTORM RESULTS COMPARISON TABLE

Location	Existing Node ID	Proposed Node ID	Existing 2-Year Critical Elevation (Gutter Line) (ft)	Existing 2-Year HGL Elevation (ft)	Height Above/Below Existing Gutter Line (ft)	Proposed 2-Year Critical Elevation (Gutter Line) (ft)	Proposed 2-Year HGL Elevation (ft)	Height Above/Below Proposed Gutter Line (ft)	Proposed 100-Year Critical Elevation (Natural Ground @ ROW) (ft)	Proposed 100-Year HGL Elevation (ft)	Height Above/Below Natural Ground @ ROW (ft)
Latma & Durhill	L1	L1	46.70	47.74	1.04	46.56	43.12	-3.44	47.89	47.04	-0.85
Latma & Marlive	L4	L4	46.47	46.39	-0.08	46.44	42.83	-3.61	47.63	46.21	-1.42
Murworth & Linkmeadow	M1	M1	46.01	48.81	2.80	46.06	43.87	-2.19	48.00	47.86	-0.14
Murworth & Marlive	M5	M5	45.99	46.73	0.74	45.64	43.27	-2.37	47.61	47.28	-0.33
Latma & Elmridge	C1	C1	47.56	47.44	-0.12	47.28	44.72	-2.56	48.72	47.56	-1.16
Latma & Cloverdale	C5	C5	47.49	47.36	-0.13	47.16	44.75	-2.41	48.95	47.57	-1.38
Durhill & Ilona	D1	D1	46.29	44.88	-1.41	46.33	43.97	-2.36	48.16	44.87	-3.29
Durhill & Elmridge	D9	D10	46.04	47.38	1.34	45.96	42.42	-3.54	47.73	43.09	-4.64

Drainage System	Existing Drainage Area (Acres)	Combined Total	Existing 2-Year Peak Flow (cfs)	Combined Total	Existing 100-Year Peak Flow (cfs)	Combined Total	Proposed Drainage Area (Acres)	Proposed 2-Year Peak Flow (cfs)	Proposed 100-Year Peak Flow (cfs)
Latma	18.79	36.62	31.71	61.69	68.70	133.67	36.38	57.13	125.62
Murworth	17.83		29.98		64.97				
Cloverdale	13.46	N/A	22.87	N/A	49.60	N/A	13.94*	23.67*	50.68*
Durhill	16.71	N/A	28.98	N/A	61.67	N/A	16.46	28.41	60.06

NOTES:
* Cloverdale proposed system connects to 42" stubout from NSR 446 storm sewer system. Stubout was designed for a drainage area of 15.20 Acres and an allowable 2-year flow of 25.40 cfs.

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Houston, Texas 77027
(713) 622-9264
Fax (713) 622-9265

STATE OF TEXAS · JOHN D. RUDLOFF · 83386 · LICENSED · PROFESSIONAL ENGINEER · 10/9/11

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 | Dwn By: P. Hopkins
Date: May 2011 | Chkd By: D. Jorgensen

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

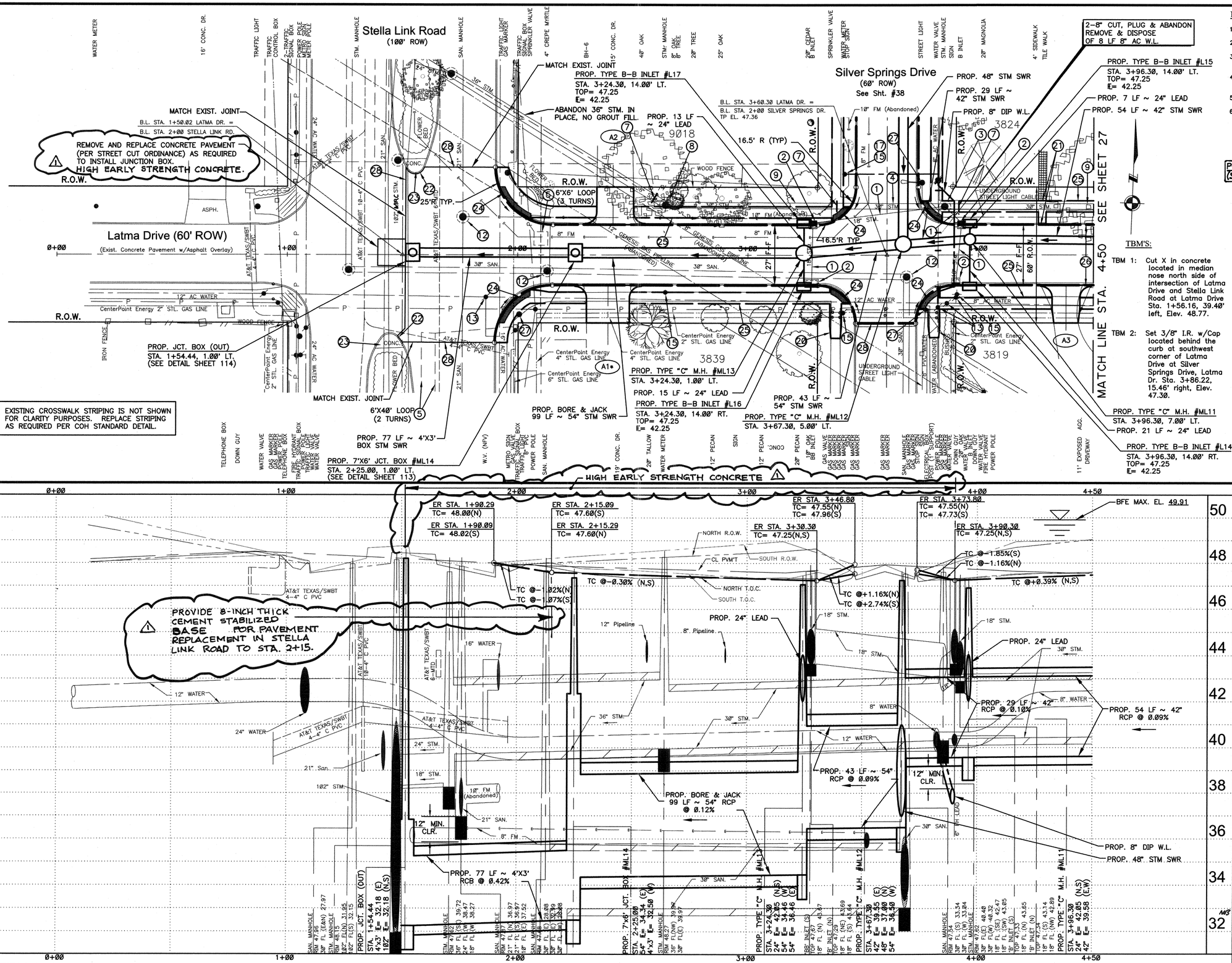
HouStorm Drainage Calcs.
Comparison Table

WBS NO.
N-000378-0002-4
DRAWING SCALE
VERT: HORZ:
CITY OF HOUSTON PM
MARK BOARD, P.E.

FOR CITY OF HOUSTON USE ONLY

PUBLIC WORKS AND ENGINEERING · APPROVED · 48978 · NUMBER · TEXAS

MB


Stella Link Road
(100' ROW)
Latma Drive (60' ROW)
Silver Springs Drive
(60' ROW)
See Sht. #38
MATCH LINE STA. 4+50 SEE SHEET 27
MATCH EXIST. JOINT
B.L. STA. 1+50.02 LATMA DR. =
B.L. STA. 2+00 STELLA LINK RD.
REMOVE AND REPLACE CONCRETE PAVEMENT (PER STREET CUT ORDINANCE) AS REQUIRED TO INSTALL JUNCTION BOX. HIGH EARLY STRENGTH CONCRETE.
PROP. JCT. BOX (OUT)
STA. 1+54.44, 1.00' LT.
(SEE DETAIL SHEET 114)
EXISTING CROSSWALK STRIPING IS NOT SHOWN FOR CLARITY PURPOSES. REPLACE STRIPING AS REQUIRED PER COH STANDARD DETAIL.
PROP. 7'X6' JCT. BOX #ML14
STA. 2+25.00, 1.00' LT.
(SEE DETAIL SHEET 113)
PROP. 77 LF ~ 4'X3' BOX STM SWR
6'X40' LOOP (2 TURNS)
PROP. BORE & JACK 99 LF ~ 54" STM SWR
PROP. TYPE B-B INLET #L17
STA. 3+24.30, 14.00' LT.
TOP= 47.25
I= 42.25
ABANDON 36" STM. IN PLACE, NO GROUT FILL.
PROP. 13 LF ~ 24" LEAD
6'X6' LOOP (3 TURNS)
PROP. TYPE "C" M.H. #ML13
STA. 3+24.30, 1.00' LT.
PROP. 15 LF ~ 24" LEAD
PROP. TYPE B-B INLET #L16
STA. 3+24.30, 14.00' RT.
TOP= 47.25
I= 42.25
PROP. TYPE "C" M.H. #ML12
STA. 3+67.30, 5.00' LT.
PROP. 43 LF ~ 54" STM SWR
2-8" CUT, PLUG & ABANDON REMOVE & DISPOSE OF 8 LF 8" AC W.L.
PROP. 48" STM SWR
PROP. 29 LF ~ 42" STM SWR
PROP. 8" DIP W.L.
PROP. TYPE B-B INLET #L15
STA. 3+96.30, 14.00' LT.
TOP= 47.25
I= 42.25
PROP. 7 LF ~ 24" LEAD
PROP. 54 LF ~ 42" STM SWR
PROP. TYPE "C" M.H. #ML11
STA. 3+96.30, 7.00' LT.
PROP. 21 LF ~ 24" LEAD
PROP. TYPE B-B INLET #L14
STA. 3+96.30, 14.00' RT.
TOP= 47.25
I= 42.25
PPCA
(SEE SHEETS 13 AND 14 FOR APPROXIMATE LIMITS)
R.O.W.
ASPH.
WOOD FENCE
IRON FENCE
CONC.
FLOWER BED
UNDERGROUND STREET LIGHT CABLE
CenterPoint Energy 2" STL. GAS LINE
CenterPoint Energy 4" STL. GAS LINE
CenterPoint Energy 6" STL. GAS LINE
12" AC WATER
8" AC WATER
4" AC WATER
AT&T TEXAS/SWBT 4-4" C PVC
16" WATER
8" WATER
24" WATER
12" WATER
36" STM.
30" STM.
24" STM.
18" STM.
21" SAN.
30" SAN.
8" FM
12" FM (Abandoned)
10" FM (Abandoned)
8" GENESIS GAS PIPELINE (ABANDONED)
27' F-F
60' R.O.W.
16.5' R (TYP)
16.5' TYP
12" MIN. CLR.
8" PVC WATER (ABANDONED)
8" PVC SEWER (ABANDONED)
3824
3839
3819
9018
A1
A2
A3
TBM'S:
TBM 1: Cut X in concrete located in median nose north side of intersection of Latma Drive and Stella Link Road at Latma Drive Sta. 1+56.16, 39.40' left, Elev. 48.77.
TBM 2: Set 3/8" I.R. w/Cap located behind the curb at southwest corner of Latma Drive at Silver Springs Drive, Latma Dr. Sta. 3+86.22, 15.46' right, Elev. 47.30.
NOTES:
1. SEE SHEET 4 FOR KEYED NOTE CALLOUTS
2. SEE SHEETS 5,6, &7 FOR HORIZONTAL CONTROLS
3. FOR EXISTING UNDERGROUND UTILITIES NOTES (SEE SHEET 3)
4. ALL PAVING OFFSETS ARE SYMMETRICAL ABOUT THE BASELINE UNLESS OTHERWISE NOTED.
5. SEE SHEET 121 FOR DRIVEWAY TABLE
6. ALL ELEVATIONS SHOWN IN HOUSTORM CALCULATIONS ARE IN TSARP DATUM (1988 DATUM, 2001 ADJ.). SURVEY AND PLAN ELEVATIONS ARE IN NSRS (CORS) DATUM; EQUATION TO TIE FROM NSRS (CORS) DATUM TO TSARP DATUM IS: TSARP EL. (ft) = NSRS EL. (ft) – 0.21
GENESIS CRUDE OIL, L.P.
CONTACT DANNY MCREA AT (713) 860-2755 AT LEAST 48 HOURS PRIOR TO CONSTRUCTION.
* SEE DRIVEWAY TABLE (SHEET 121)
STANDARD PROFILE LEGEND
CENTER LINE OF R.O.W.
PROPERTY LINE N & E
PROPERTY LINE S & W
DITCH OR TOP OF CURB N&E
DITCH OR TOP OF CURB S&W
2 ADDED PPCA LIMITS 01/12 AS HW
1 DESIRED LIMITS OF HIGH EARLY STRENGTH CONC. 12/6 DP HW
MK. DESCRIPTION DATE DWN. CHK.
REVISIONS
PRIVATE UTILITY LINES SHOWN
AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.
Centerpoint Energy Power Facilities
(Approved only for crossing underground ductlines, unless otherwise noted.)
Valid At Time Of Review Only
Date: 11/3/11
Approved for AT&T Texas/SWBT underground conduit facilities only.
Signature valid for one year.
Date: 11-1-11
Centerpoint Energy Gas Facilities
(Centerpoint service lines are not shown.)
Date: 11/3/11
Cable Company
Date:
HDR | CLAUNCH & MILLER
Engineering Consultants
4635 Southwest Freeway, Suite 1000• Houston, Texas 77027
(713) 622-9264• Fax (713) 622-9265• www.hdrinc.com
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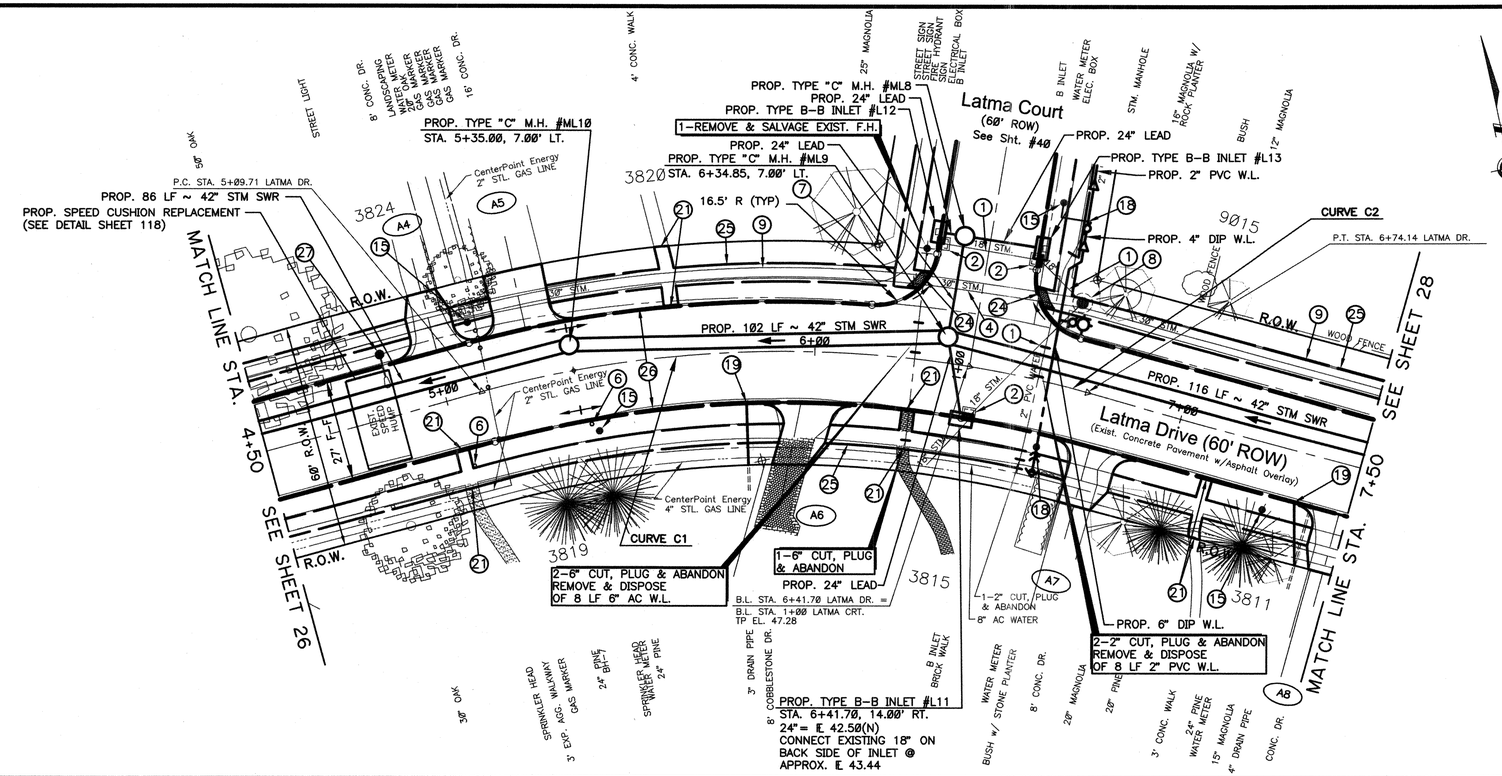
STATE OF TEXAS
JOHN D. RUDLOFF
83386
LICENSED
PROFESSIONAL ENGINEER
10/19/11
SURVEYED BY:
Landtech Consultants, Inc.
FB NO. FB#5543
Job No.: 09-051
Dwn By: P. Hopkins
Date: May 2011
Chkd By: D. Jorgensen
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
City of Houston
Neighborhood Street Reconstruction
Project NSR 446A
Latma Drive
Sta. 0+00 to Sta. 4+50
WBS NO.
N-000378-0002-4
DRAWING SCALE
VERT: 1"=2' HORZ: 1"=20'
CITY OF HOUSTON PM
MARK BOARD, P.E.
SHEET No: 26 OF 122
FOR CITY OF HOUSTON USE ONLY
PUBLIC WORKS AND ENGINEERING
REVIEWED AND FILED
48978
NUMBER
TEXAS
0+00
1+00
2+00
3+00
4+00
4+50
50
48
46
44
42
40
38
36
34
32
HIGH EARLY STRENGTH CONCRETE
PROVIDE 8-INCH THICK CEMENT STABILIZED BASE FOR PAVEMENT REPLACEMENT IN STELLA LINK ROAD TO STA. 2+15.
ER STA. 1+90.29
TC= 48.00(N)
ER STA. 1+90.09
TC= 48.02(S)
ER STA. 2+15.29
TC= 47.60(N)
ER STA. 2+15.09
TC= 47.60(S)
ER STA. 3+46.80
TC= 47.55(N)
TC= 47.96(S)
ER STA. 3+30.30
TC= 47.25(N,S)
ER STA. 3+73.80
TC= 47.55(N)
TC= 47.73(S)
ER STA. 3+90.30
TC= 47.25(N,S)
BFE MAX. EL. 49.91
TC @-1.85%(S)
TC @-1.16%(N)
TC @+0.39% (N,S)
TC @-0.30% (N,S)
TC @-1.02%(N)
TC @-1.07%(S)
TC @+1.16%(N)
TC @+2.74%(S)
NORTH R.O.W.
SOUTH R.O.W.
CL PVM'T
NORTH T.O.C.
SOUTH T.O.C.
PROP. 24" LEAD
PROP. 29 LF ~ 42" RCP @ 0.10%
PROP. 54 LF ~ 42" RCP @ 0.09%
PROP. 43 LF ~ 54" RCP @ 0.09%
PROP. BORE & JACK 99 LF ~ 54" RCP @ 0.12%
PROP. 77 LF ~ 4'X3' RCB @ 0.42%
PROP. 8" DIP W.L.
PROP. 48" STM SWR
PROP. JCT. BOX (OUT) STA. 1+54.44 4'X3' I= 32.18 (E) I= 32.18 (N,S) 102" I= 32.15 102" FL(S) 32.15 102" FL(N) 31.95
PROP.: 7'X6' JCT. BOX #ML14 STA. 2+25.00 5'4" I= 34.34 (E) 4'X3' I= 32.50 (W)
PROP.: TYPE "C" M.H. #ML13 STA. 3+24.30 2'4" I= 42.05 (N,S) 5'4" I= 34.46 (W) 5'4" I= 36.46 (E)
PROP.: TYPE "C" M.H. #ML12 STA. 3+67.30 42" I= 39.55 (E) 48" I= 37.00 (N) 54" I= 36.50 (W)
PROP.: TYPE "C" M.H. #ML11 STA. 3+96.30 2'4" I= 42.05 (N,S) 42" I= 39.58 (E,W)
SAN. MANHOLE RIM 47.96 30" FL (E&N) 27.97
STM. MANHOLE RIM 45.15 102" FL(N) 31.95 102" FL(S) 32.15
STM. MANHOLE RIM 47.61 30" FL(E) 39.72 30" FL(W) 38.47 24" FL (W) 38.47 18" FL (W) 38.27
SAN. MANHOLE RIM 47.61 30" FL (N) 36.97 21" FL (S) 36.97 10" FL (E) 37.52
SAN. MANHOLE RIM 47.48 30" FL (E) 42.08 30" FL (W) 42.08 30" FL (N) 28.98
STM. MANHOLE RIM 47.61 30" FL(E) 39.97 36" FL(NW) 39.97 36" FL(E) 39.97
8B" INLET (S) TOP 47.29 18" FL (N) 45.87
8' INLET (N) TOP 47.29 18" FL (NE) 43.69 18" FL (S) 44.44
SAN. MANHOLE RIM 47.54 30" FL (S) 33.54 30" FL (W) 33.84
STM. MANHOLE RIM 47.82 30" FL(E) 40.40 30" FL(W) 40.32 18" FL (SE) 42.47 18" FL (SW) 43.85
8' INLET (S) TOP 47.33 18" FL (N) 43.85
8' INLET (N) TOP 47.33 18" FL (S) 43.14 18" FL (NW) 42.89
PROP.: TYPE "C" M.H. STA. 3+96.30 2'4" I= 42.05 (N,S) 42" I= 39.58 (E,W)



NOTES:

1. SEE SHEET 4 FOR KEYED NOTE CALLOUTS
2. SEE SHEETS 5,6, &7 FOR HORIZONTAL CONTROLS
3. FOR EXISTING UNDERGROUND UTILITIES NOTES (SEE SHEET 3)
4. ALL PAVING OFFSETS ARE SYMMETRICAL ABOUT THE BASELINE UNLESS OTHERWISE NOTED.
5. SEE SHEET 121 FOR DRIVEWAY TABLE
6. ALL ELEVATIONS SHOWN IN HOUSTORM CALCULATIONS ARE IN TSARP DATUM (1988 DATUM, 2001 ADJ.). SURVEY AND PLAN ELEVATIONS ARE IN NSRS (CORS) DATUM; EQUATION TO TIE FROM NSRS (CORS) DATUM TO TSARP DATUM IS:
TSARP EL. (ft) = NSRS EL. (ft) – 0.21

PPCA
(SEE SHEETS 13 AND 14 FOR APPROXIMATE LIMITS)

TBM'S:

TBM 3: Set 3/8" IR w/Cap located behind the curb on south side of Latma Drive at the Latma Court intersection, Latma Dr. Sta. 6+47.48, 16.34' right, Elev. 48.04

STANDARD PROFILE LEGEND

CENTER LINE OF R.O.W. ——————
PROPERTY LINE N & E ——— — ———
PROPERTY LINE S & W — — — — —
DITCH OR TOP OF CURB N&E ——— – ———
DITCH OR TOP OF CURB S&W ——— – ———

MK.	DESCRIPTION	DATE	DWN.	CHK.
1	ADDED PPCA LIMITS	01/12	AS	HW

REVISIONS

PRIVATE UTILITY LINES SHOWN
AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.

Centerpoint Energy Power Facilities — Date: 11/3/11
(Approved only for crossing underground ductlines, unless otherwise noted.)
Valid At Time Of Review Only

Approved for AT&T Texas/SWBT underground conduit facilities only. — Date: 11-1-11
Signature valid for one year.

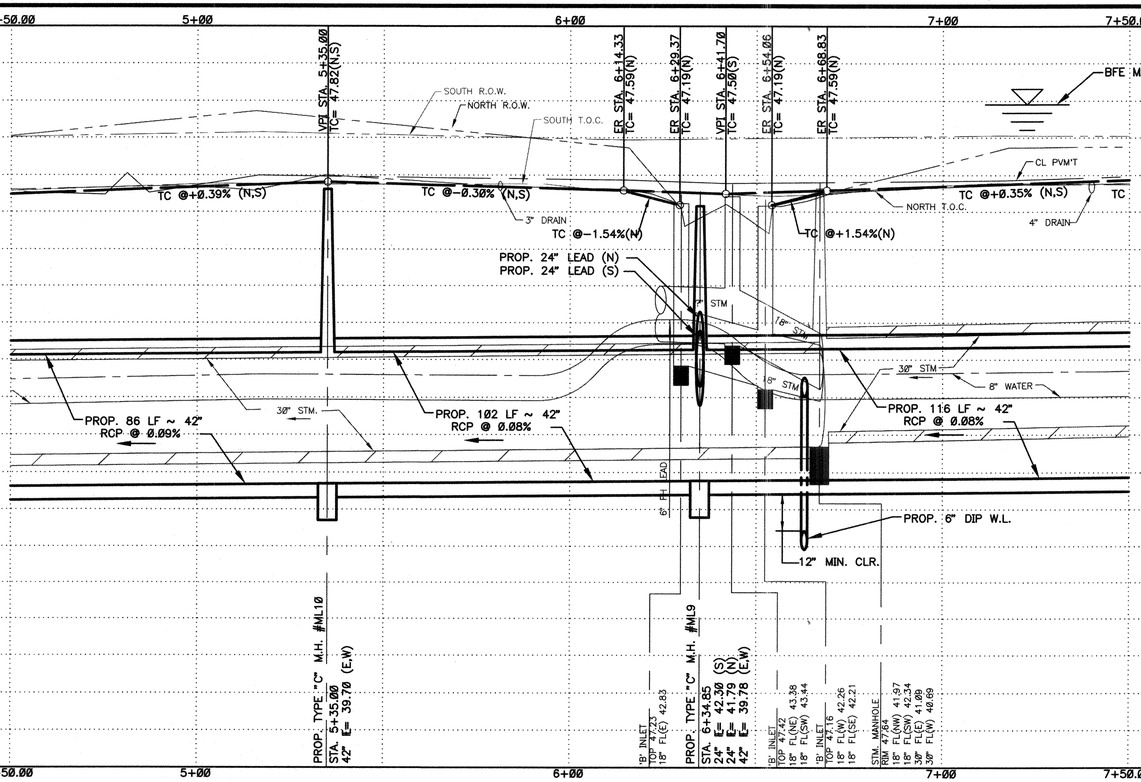
Centerpoint Energy Gas Facilities — Date: 11/3/11
(Centerpoint service lines are not shown.)

Cable Company — Date:

CURVE DATA

C1
Δ = 24°28'25"
R = 389.00'
Arc Length = 131.99'
Chord Bearing = N80°11'06"W
Chord Length = 130.99'
T = 67.02'
E = 7.18'

C2
Δ = 06°00'58"
R = 309.00'
Arc Length = 32.45'
Chord Bearing = N64°56'25"W
Chord Length = 32.43'
T = 16.24'
E = 0.43'



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SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

STATE OF TEXAS — JOHN D. RUDLOFF — 83386 — LICENSED PROFESSIONAL ENGINEER
10/19/11

Job No.: 09-051	Dwn By: P. Hopkins
Date: May 2011	Chkd By: D. Jorgensen

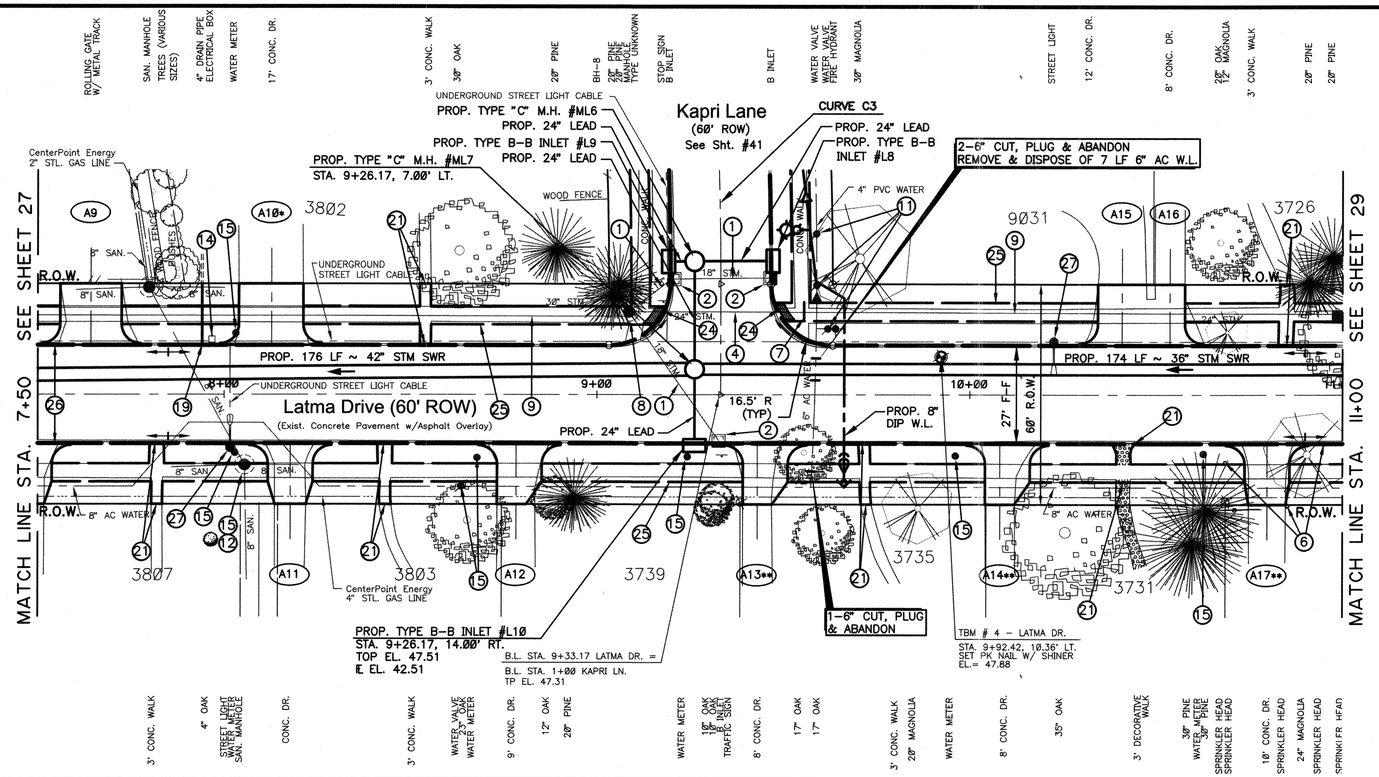
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Latma Drive
Sta. 4+50 to Sta. 7+50

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	
DRAWING SCALE	
VERT: 1"=2' HORZ: 1"=20'	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	
SHEET No: 27 OF 122	

PUBLIC WORKS AND ENGINEERING — FILED — 48978 — NUMBER — TEXAS



NOTES:

1. SEE SHEET 4 FOR KEYED NOTE CALLOUTS
2. SEE SHEETS 5,6, &7 FOR HORIZONTAL CONTROLS
3. FOR EXISTING UNDERGROUND UTILITIES NOTES (SEE SHEET 3)
4. ALL PAVING OFFSETS ARE SYMMETRICAL ABOUT THE BASELINE UNLESS OTHERWISE NOTED.
5. SEE SHEET 121 FOR DRIVEWAY TABLE
6. ALL ELEVATIONS SHOWN IN HOUSTORM CALCULATIONS ARE IN TSARP DATUM (1988 DATUM, 2001 ADJ.). SURVEY AND PLAN ELEVATIONS ARE IN NSRS (CORS) DATUM; EQUATION TO TIE FROM NSRS (CORS) DATUM TO TSARP DATUM IS:
TSARP EL. (ft) = NSRS EL. (ft) - 0.21

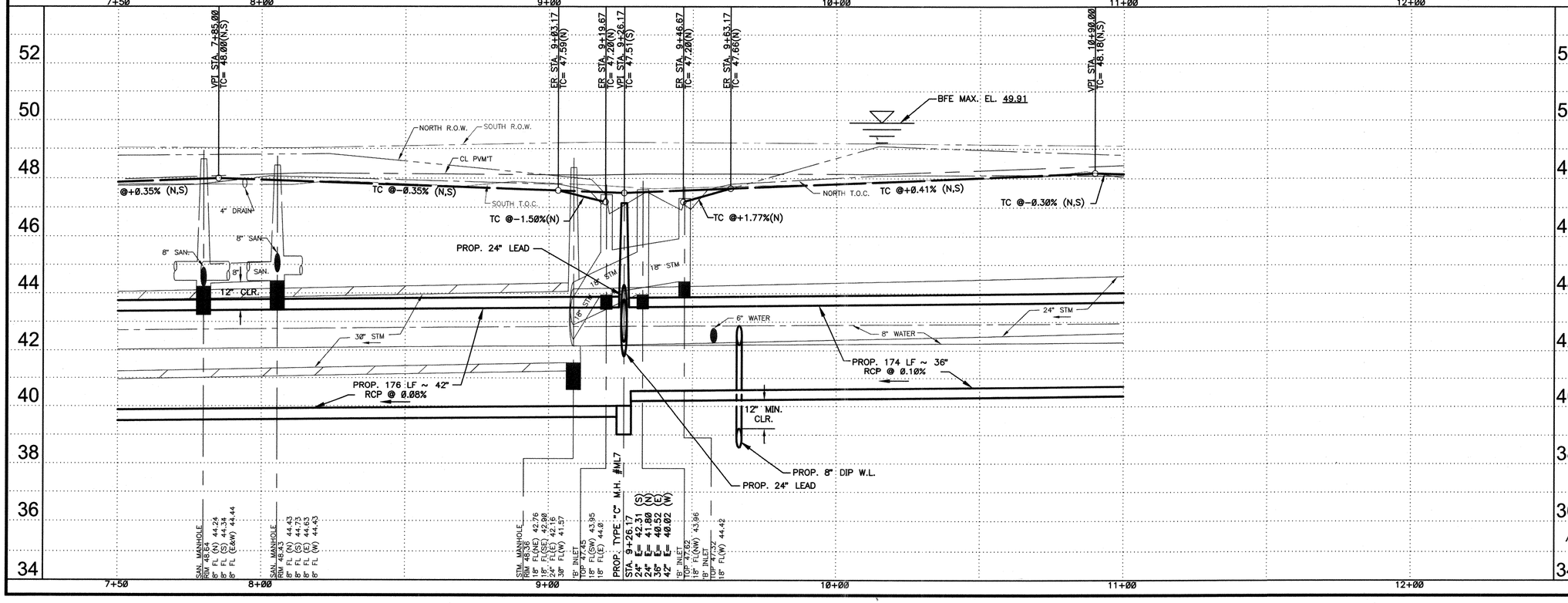
TBM'S:

TBM 4: Set PK Nail w/Shiner located in the north lane pavement of Latma Drive at Sta. 9+92. 10.36' left, Elev. 47.88.

* SEE DRIVEWAY TABLE (SHEET 121)
** SEE NOTE ON DRIVEWAY TABLE (SHEET 121)

CURVE DATA

C3
Δ = 30°29'23"
R = 1009.64'
Arc Length = 537.27'
Chord Bearing = N12°49'23"E
Chord Length = 530.96'
T = 275.16'
E = 36.82'



STANDARD PROFILE LEGEND

CENTER LINE OF R.O.W.
PROPERTY LINE N & E
PROPERTY LINE S & W
DITCH OR TOP OF CURB N&E
DITCH OR TOP OF CURB S&W

MK.	DESCRIPTION	DATE	DWN.	CHK.

REVISIONS

PRIVATE UTILITY LINES SHOWN
AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.

Centerpoint Energy Power Facilities — Date: 11/3/11
(Approved only for crossing underground ductlines, unless otherwise noted.)
Valid At Time Of Review Only

Approved for AT&T Texas/SWBT underground conduit facilities only. — Date: 11-1-11
Signature valid for one year.

Centerpoint Energy Gas Facilities — Date: 11/3/11
(Centerpoint service lines are not shown.)

Cable Company — Date:

HDR | CLAUNCH & MILLER Engineering Consultants
4635 Southwest Freeway, Suite 1000• Houston, Texas 77027
(713) 622-9264• Fax (713) 622-9265• www.hdrinc.com
HDR Engineering Inc. Texas Reg. No. F-754

JOHN D. RUDLOFF
4635 Southwest Freeway
Suite 1000
Houston, Texas 77027
(713) 622-9264
Fax (713) 622-9265

STATE OF TEXAS — JOHN D. RUDLOFF — 83386 — LICENSED PROFESSIONAL ENGINEER — 10/19/11

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 | Dwn By: P. Hopkins
Date: May 2011 | Chkd By: D. Jorgensen

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

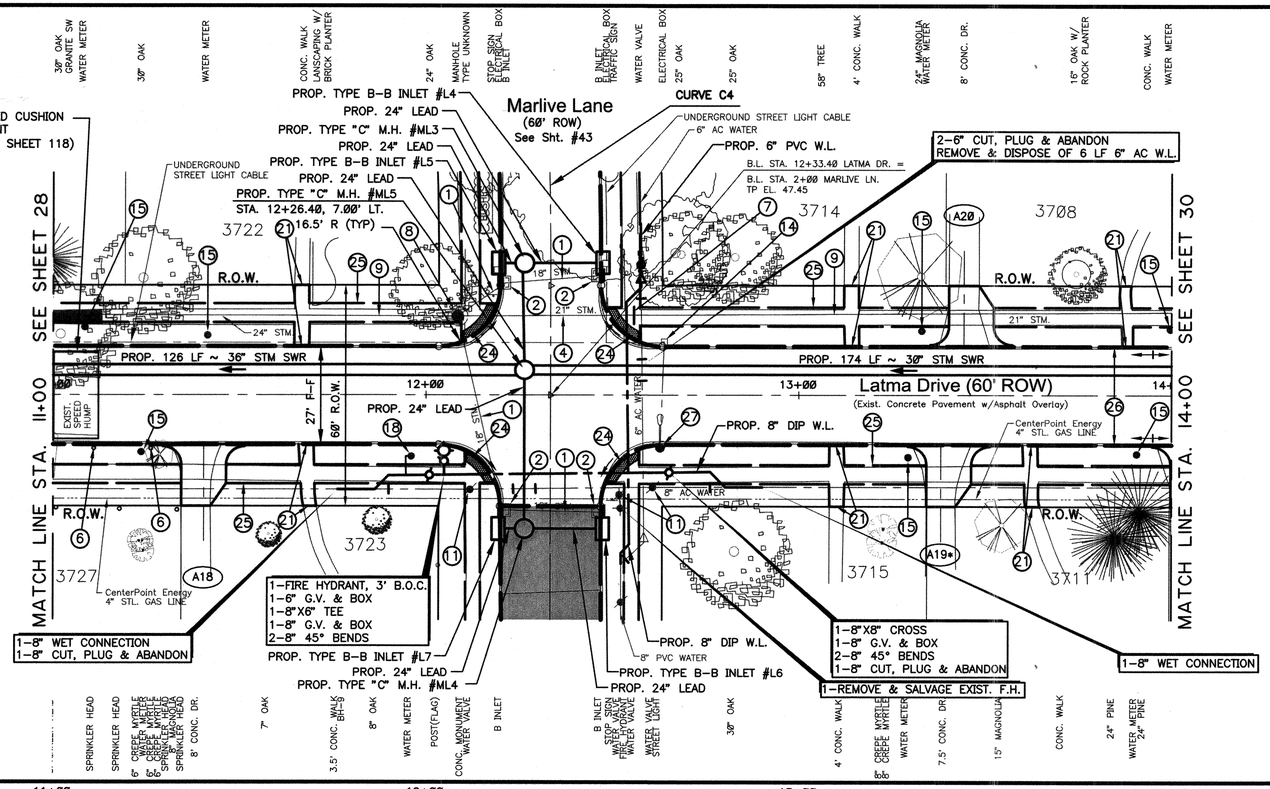
City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

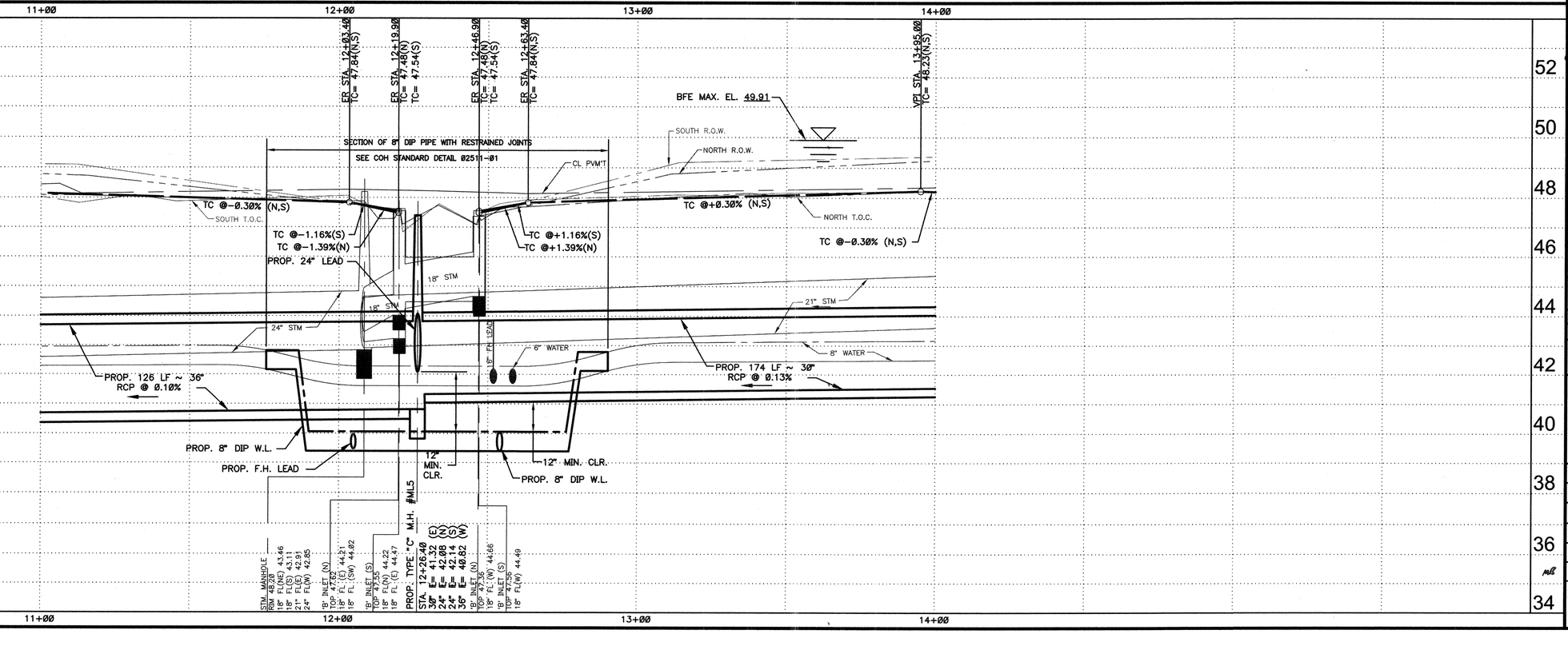
Latma Drive
Sta. 7+50 to Sta. 11+00

WBS NO.
N-000378-0002-4
DRAWING SCALE
VERT: 1"=2' HORZ: 1"=20'
CITY OF HOUSTON PM
MARK BOARD, P.E.

FOR CITY OF HOUSTON USE ONLY
PUBLIC WORKS AND ENGINEERING — REVIEWED — 48978 — NUMBER

SHEET No: 28 OF 122





TBM'S:

TBM 7: Set 3/8" IR w/Cap located behind the curb in the northeast corner of Latma Drive intersection with Marlive Lane, Latma Dr. Sta. 12+80.18, 16.31' left, Elev. 48.32

NOTES:

1. SEE SHEET 4 FOR KEYED NOTE CALLOUTS
2. SEE SHEETS 5,6, &7 FOR HORIZONTAL CONTROLS
3. FOR EXISTING UNDERGROUND UTILITIES NOTES (SEE SHEET 3)
4. ALL PAVING OFFSETS ARE SYMMETRICAL ABOUT THE BASELINE UNLESS OTHERWISE NOTED.
5. SEE SHEET 121 FOR DRIVEWAY TABLE
6. ALL ELEVATIONS SHOWN IN HOUSTORM CALCULATIONS ARE IN TSARP DATUM (1988 DATUM, 2001 ADJ.). SURVEY AND PLAN ELEVATIONS ARE IN NSRS (CORS) DATUM; EQUATION TO TIE FROM NSRS (CORS) DATUM TO TSARP DATUM IS: TSARP EL. (ft) = NSRS EL. (ft) - 0.21

PROP. CONCRETE TRANSITION (SEE DETAIL SHEET 118)

* SEE DRIVEWAY TABLE (SHEET 121)

CURVE DATA

C4
Δ = 30°29'23"
R = 1302.89'
Arc Length = 693.33'
Chord Bearing = N12°49'23"E
Chord Length = 685.17'
T = 355.08'
E = 47.52'

STANDARD PROFILE LEGEND

CENTER LINE OF R.O.W.
PROPERTY LINE N & E
PROPERTY LINE S & W
DITCH OR TOP OF CURB N&E
DITCH OR TOP OF CURB S&W

MK.	DESCRIPTION	DATE	DWN.	CHK.

REVISIONS

PRIVATE UTILITY LINES SHOWN
AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.

Centerpoint Energy Power Facilities Date: 11/3/11
(Approved only for crossing underground ductlines, unless otherwise noted.)
Valid At Time Of Review Only

Approved for AT&T Texas/SWBT underground conduit facilities only. Date: 11-1-11
Signature valid for one year.

Centerpoint Energy Gas Facilities Date: 11/3/11
(Centerpoint service lines are not shown.)

Cable Company Date:

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Engineering Consultants
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Fax (713) 622-9265

STATE OF TEXAS · JOHN D. RUDLOFF · 83386 · LICENSED PROFESSIONAL ENGINEER
10/19/11

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 Dwn By: P. Hopkins
Date: May 2011 Chkd By: D. Jorgensen

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Latma Drive
Sta. 11+00 to Sta. 14+00

WBS NO.
N-000378-0002-4

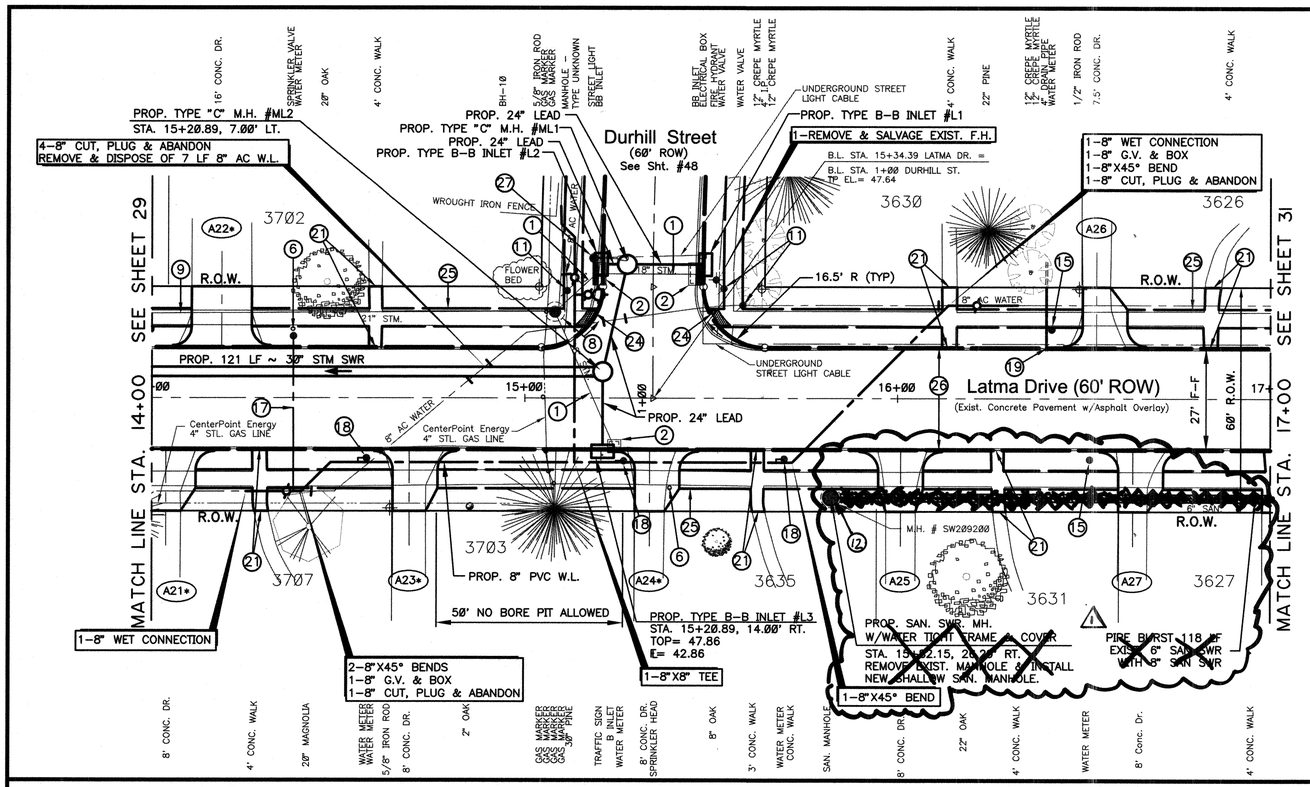
DRAWING SCALE
VERT: 1"=2' HORZ: 1"=20'

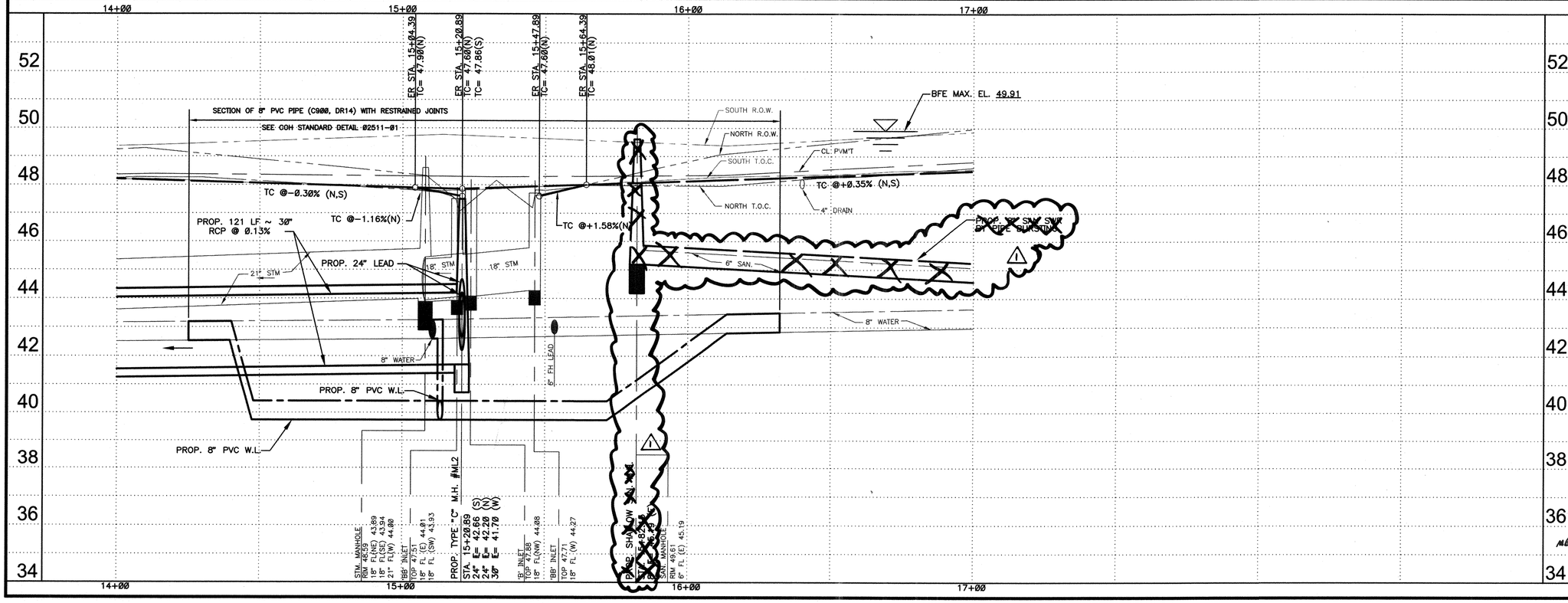
CITY OF HOUSTON PM
MARK BOARD, P.E.

SHEET No: 29 OF 122

FOR CITY OF HOUSTON USE ONLY

PUBLIC WORKS AND ENGINEERING · ANN J. RUED · 48978 · NUMBER · REGISTERED





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PPCA
(SEE SHEETS 13 AND 14 FOR APPROXIMATE LIMITS)

TBM'S:

TBM 8: Set PK Nail w/Shiner located in the pavement in the northwest quadrant of the Latma Drive intersection with Durhill Street at Latma Dr. Sta. 15+16.49, 12.32' left, Elev. 47.82

* SEE DRIVEWAY TABLE (SHEET 121)

STANDARD PROFILE LEGEND

CENTER LINE OF R.O.W.
PROPERTY LINE N & E
PROPERTY LINE S & W
DITCH OR TOP OF CURB N&E
DITCH OR TOP OF CURB S&W

MK.	DESCRIPTION	DATE	DWN.	CHK.
2	ADDED PPCA LIMITS	01/12	AS	HW
1	REVISE SAN. SWR.	12/22/11	AS	HW

REVISIONS

PRIVATE UTILITY LINES SHOWN
AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.

Centerpoint Energy Power Facilities — Date: 11/3/11
(Approved only for crossing underground ductlines, unless otherwise noted.) Valid At Time Of Review Only

Approved for AT&T Texas/SWBT underground conduit facilities only. Signature valid for one year. — Date: 11-1-11

Centerpoint Energy Gas Facilities — Date: 11/3/11
(Centerpoint service lines are not shown.)

Cable Company — Date:

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Fax (713) 622-9265

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

STATE OF TEXAS — JOHN D. RUDLOFF — 83386 — LICENSED PROFESSIONAL ENGINEER — 10/19/11

Job No.: 09-051	Dwn By: P. Hopkins
Date: May 2011	Chkd By: D. Jorgensen

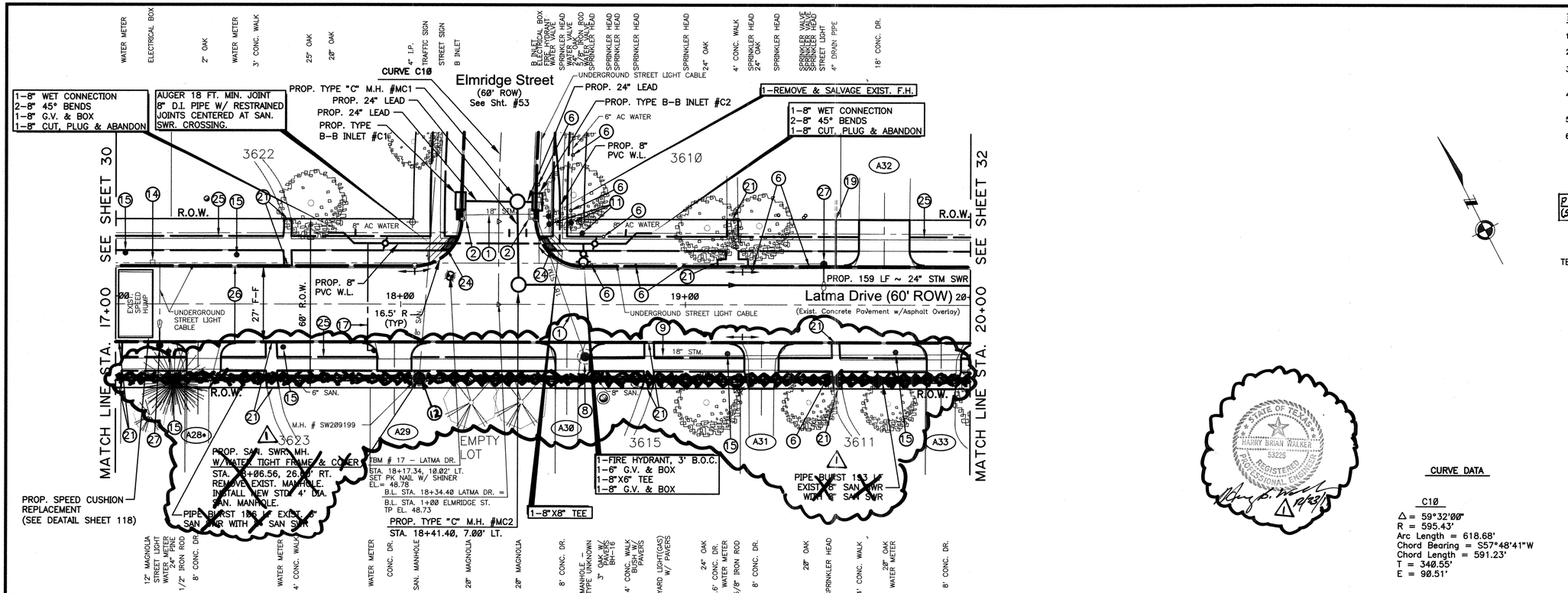
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

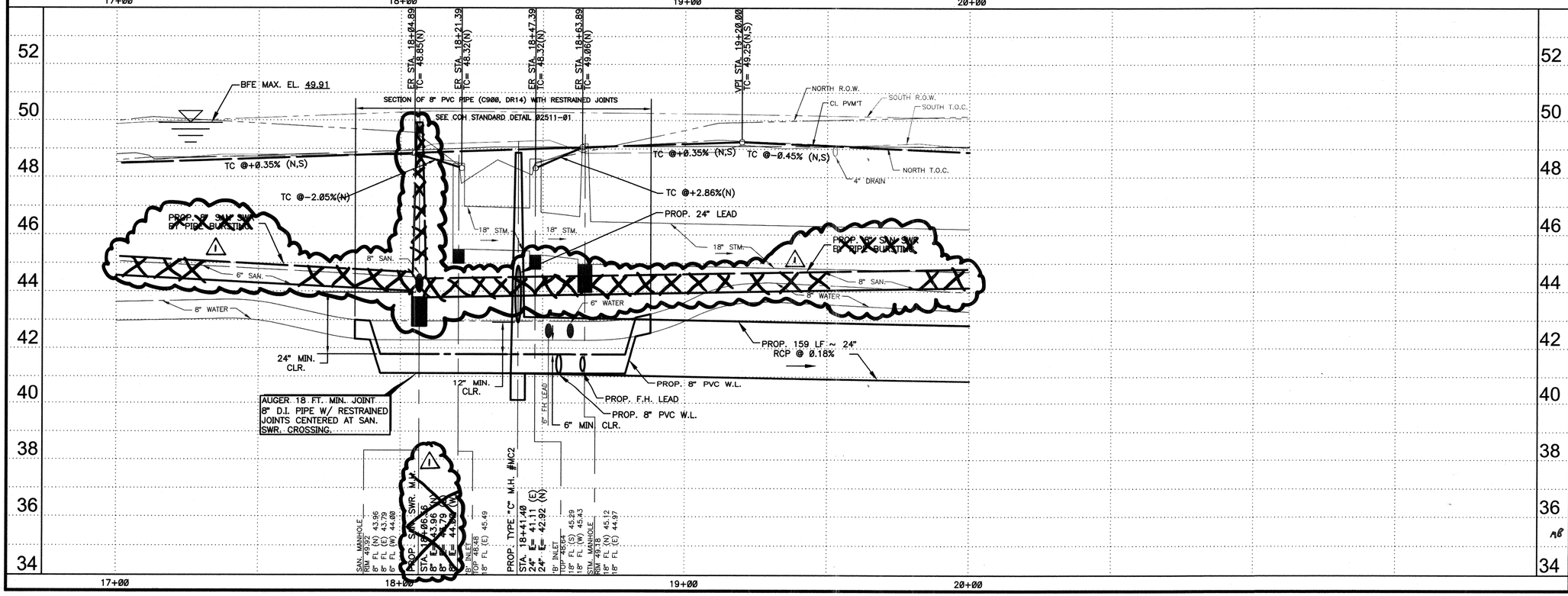
City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Latma Drive
Sta. 14+00 to Sta. 17+00

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	
DRAWING SCALE	
VERT: 1"=2' HORZ: 1"=20'	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	
SHEET No: 30 OF 122	

PUBLIC WORKS AND ENGINEERING — FILED — 48978 — NUMBER — TEXAS





NOTES:

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PPCA
(SEE SHEETS 13 AND 14 FOR APPROXIMATE LIMITS)

TBM'S:

TBM 17: Set PK Nail w/Shiner located in the pavement within the nortwest quadrant of the Latma Drive and Elmridge Street intersection at Latma Drive Sta. 18+73.34, 10.02' left, Elev. 48.78.

* SEE DRIVEWAY TABLE (SHEET 121)

STATE OF TEXAS
HARRY BRIAN WALKER
53225
REGISTERED
PROFESSIONAL ENGINEER
12/22/11

CURVE DATA

C1Ø
△ = 59°32'ØØ"
R = 595.43'
Arc Length = 618.68'
Chord Bearing = S57°48'41"W
Chord Length = 591.23'
T = 34Ø.55'
E = 9Ø.51'

STANDARD PROFILE LEGEND

CENTER LINE OF R.O.W.
PROPERTY LINE N & E
PROPERTY LINE S & W
DITCH OR TOP OF CURB N&E
DITCH OR TOP OF CURB S&W

MK.	DESCRIPTION	DATE	DWN.	CHK.
2	ADDED PPCA LIMITS	01/12	AS	HW
1	REVISION SAN. SWR.	12-22-11	AS	HW

REVISIONS

PRIVATE UTILITY LINES SHOWN
AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.

Centerpoint Energy Power Facilities — Date: 11/3/11
(Approved only for crossing underground ductlines, unless otherwise noted.) Valid At Time Of Review Only

Approved for AT&T Texas/SWBT underground conduit facilities only. Signature valid for one year. — Date: 11-1-11

Centerpoint Energy Gas Facilities — Date: 11/3/11
(Centerpoint service lines are not shown.)

Cable Company — Date:

HDR | CLAUNCH & MILLER
Engineering Consultants
4635 Southwest Freeway, Suite 1000• Houston, Texas 77027
(713) 622-9264• Fax (713) 623-9265• www.hdrinc.com
HDR Engineering Inc. Texas Reg. No. F-754

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4635 Southwest Freeway
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Houston, Texas 77027
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Fax (713) 622-9265

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

STATE OF TEXAS
JOHN D. RUDLOFF
83386
LICENSED
PROFESSIONAL ENGINEER
10/19/11

Job No.: 09-051 — Dwn By: P. Hopkins
Date: May 2011 — Chkd By: D. Jorgensen

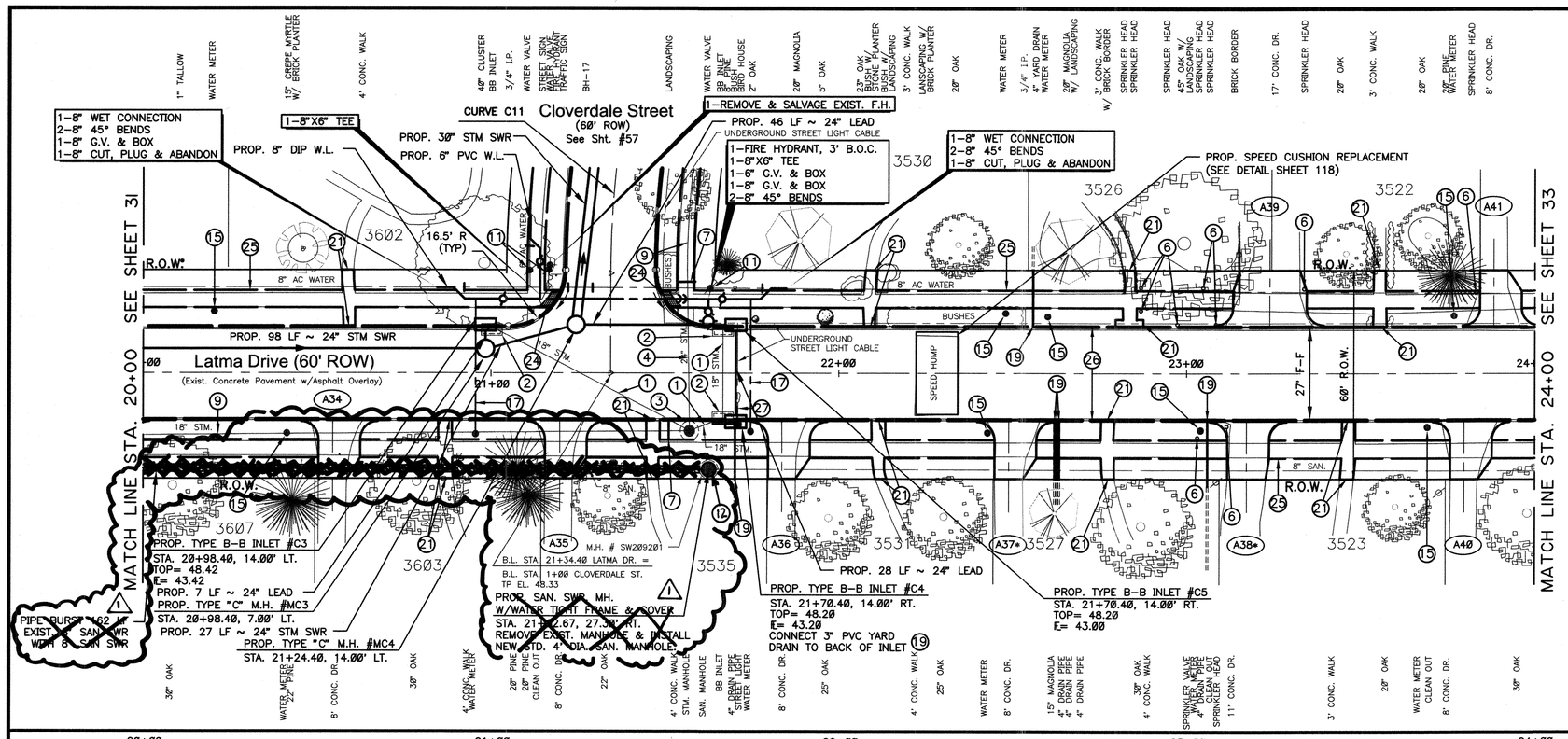
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Latma Drive
Sta. 17+00 to Sta. 20+00

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	
DRAWING SCALE	
VERT: 1"=2' HORZ: 1"=20'	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	
SHEET No: 31 OF 122	

PUBLIC WORKS AND ENGINEERING
REVIEWED AND FILED
48978
NUMBER
TEXAS



TBM'S:

TBM 17: Set PK Nail w/Shiner located in the pavement within the nortwest quadrant of the Latma Drive and Elmridge Street intersection at Latma Drive Sta. 18+73.34, 10.02' left, Elev. 48.78.

TBM 19: Cut X in concrete located on the east side of Westridge Street at the Latma Drive intersection at Westridge Street Sta. 3+65.35,7.73' right, Elev. 49.10.

TBM 27: Set concrete nail w/shiner in concrete pavement located in the north lane of Cloverdale Street at Sta. 4+43.14, 10.08' left, Elev. 48.72.

NOTES:

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2. SEE SHEETS 5,6, &7 FOR HORIZONTAL CONTROLS
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4. ALL PAVING OFFSETS ARE SYMMETRICAL ABOUT THE BASELINE UNLESS OTHERWISE NOTED.
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6. ALL ELEVATIONS SHOWN IN HOUSTORM CALCULATIONS ARE IN TSARP DATUM (1988 DATUM, 2001 ADJ.). SURVEY AND PLAN ELEVATIONS ARE IN NSRS (CORS) DATUM; EQUATION TO TIE FROM NSRS (CORS) DATUM TO TSARP DATUM IS: TSARP EL. (ft) = NSRS EL. (ft) – 0.21

PDCA
(SEE SHEETS 13 AND 14 FOR APPROXIMATE LIMITS)

* SEE DRIVEWAY TABLE (SHEET 121)

STATE OF TEXAS
HARRY BRIAN WALKER
53225
REGISTERED
PROFESSIONAL ENGINEER
12/23/11

CURVE DATA

C11
△ = 59°32'00"
R = 295.43'
Arc Length = 306.97'
Chord Bearing = S57°48'41"W
Chord Length = 293.34'
T = 168.97'
E = 44.91'

STANDARD PROFILE LEGEND

CENTER LINE OF R.O.W.
PROPERTY LINE N & E
PROPERTY LINE S & W
DITCH OR TOP OF CURB N&E
DITCH OR TOP OF CURB S&W

MK.	DESCRIPTION	DATE	DWN.	CHK.
2	ADDED PDCA LIMITS	01/12	AS	HW
1	REVISED SAN. SWR.	12-22-11	AS	HW

REVISIONS

PRIVATE UTILITY LINES SHOWN
AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.

Centerpoint Energy Power Facilities — Date: 11/7/11
(Approved only for crossing underground ductlines, unless otherwise noted.)
Valid At Time Of Review Only

Approved for AT&T Texas/SWBT underground conduit facilities only. — Date: 11-1-11
Signature valid for one year.

Centerpoint Energy Gas Facilities — Date: 11/3/11
(Centerpoint service lines are not shown.)

Cable Company — Date:

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STATE OF TEXAS
JOHN D. RUDLOFF
83386
LICENSED
PROFESSIONAL ENGINEER
10/19/11

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5545

Job No.: 09-051 — Dwn By: P. Hopkins
Date: May 2011 — Chkd By: D. Jorgensen

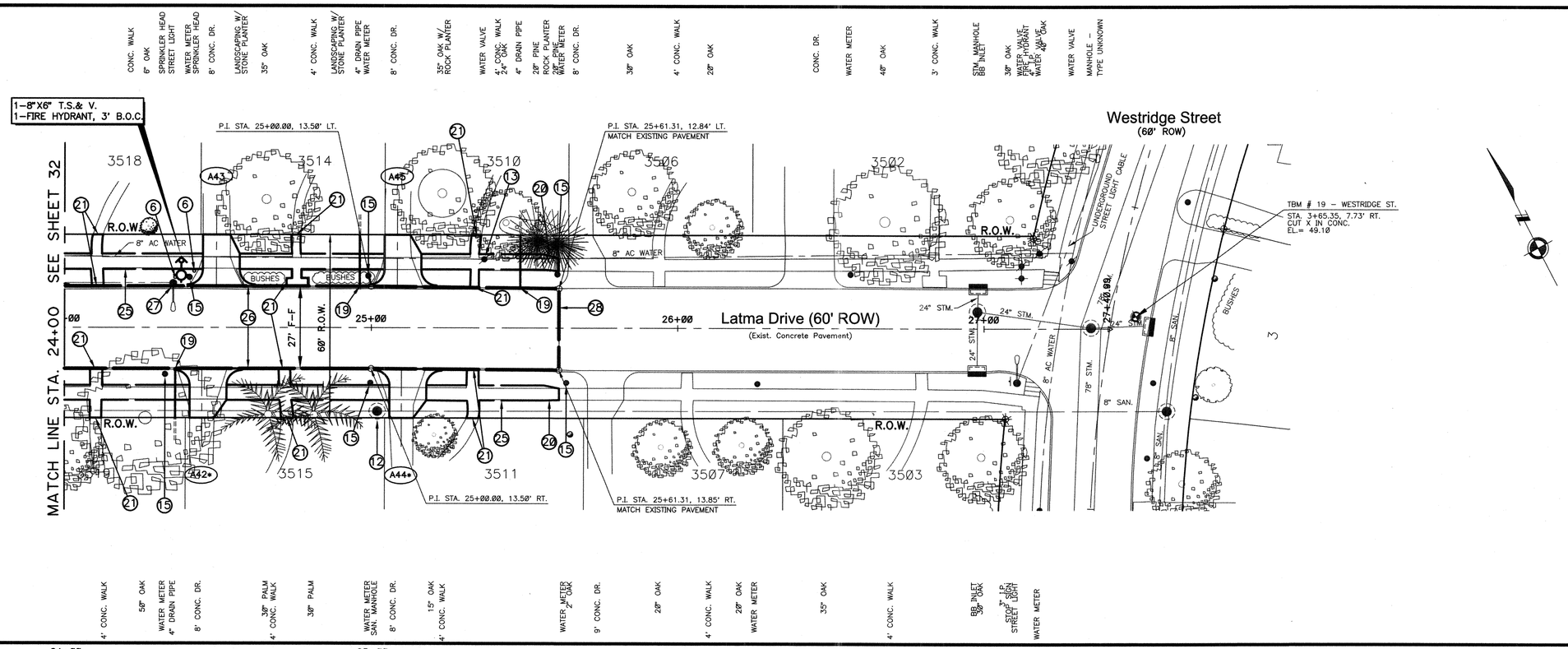
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

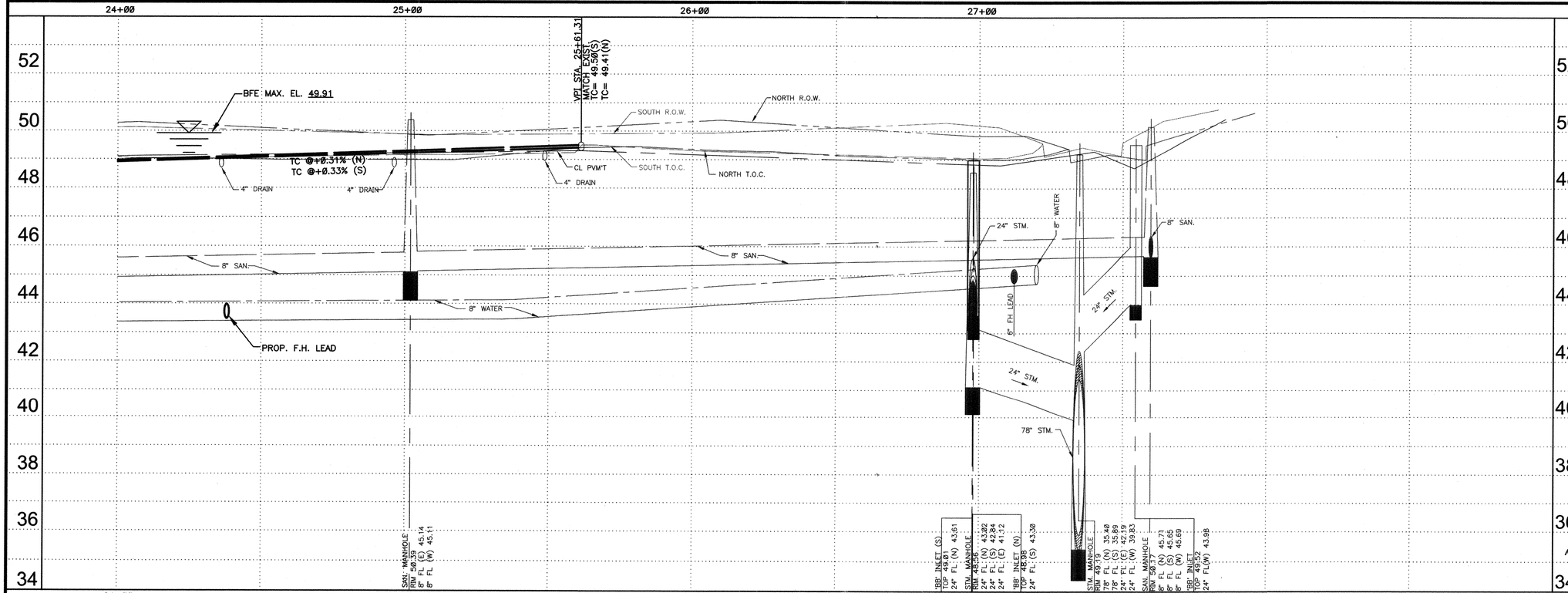
City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Latma Drive
Sta. 20+00 to Sta. 24+00

WBS NO.
N-000378-0002-4
DRAWING SCALE
VERT: 1"=2' HORZ: 1"=20'
CITY OF HOUSTON PM
MARK BOARD, P.E.
SHEET No: 32 OF 122

FOR CITY OF HOUSTON USE ONLY
PUBLIC WORKS AND ENGINEERING
EXAMINED AND FILED
48978
NUMBER
TEXAS





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   TSARP EL. (ft) = NSRS EL. (ft) - Ø.21

TBM'S:

TBM 19: Cut X in concrete located on the east side of Westridge Street at the Latma Drive intersection at Westridge Street Sta. 3+65.35,7.73' right, Elev. 49.1Ø.

* SEE DRIVEWAY TABLE (SHEET 121)

STANDARD PROFILE LEGEND

CENTER LINE OF R.O.W.
PROPERTY LINE N & E
PROPERTY LINE S & W
DITCH OR TOP OF CURB N&E
DITCH OR TOP OF CURB S&W

MK.	DESCRIPTION	DATE	DWN.	CHK.

REVISIONS

PRIVATE UTILITY LINES SHOWN
AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.

Centerpoint Energy Power Facilities Date: 11/3/11
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Valid At Time Of Review Only

Approved for AT&T Texas/SWBT underground conduit facilities only. Date: 11-1-11
Signature valid for one year.

Centerpoint Energy Gas Facilities Date: 11/8/11
(Centerpoint service lines are not shown.)

Cable Company Date:

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STATE OF TEXAS
JOHN D. RUDLOFF
83386
LICENSED
PROFESSIONAL ENGINEER
10/19/11

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 | Dwn By: P. Hopkins
Date: May 2011 | Chkd By: D. Jorgensen

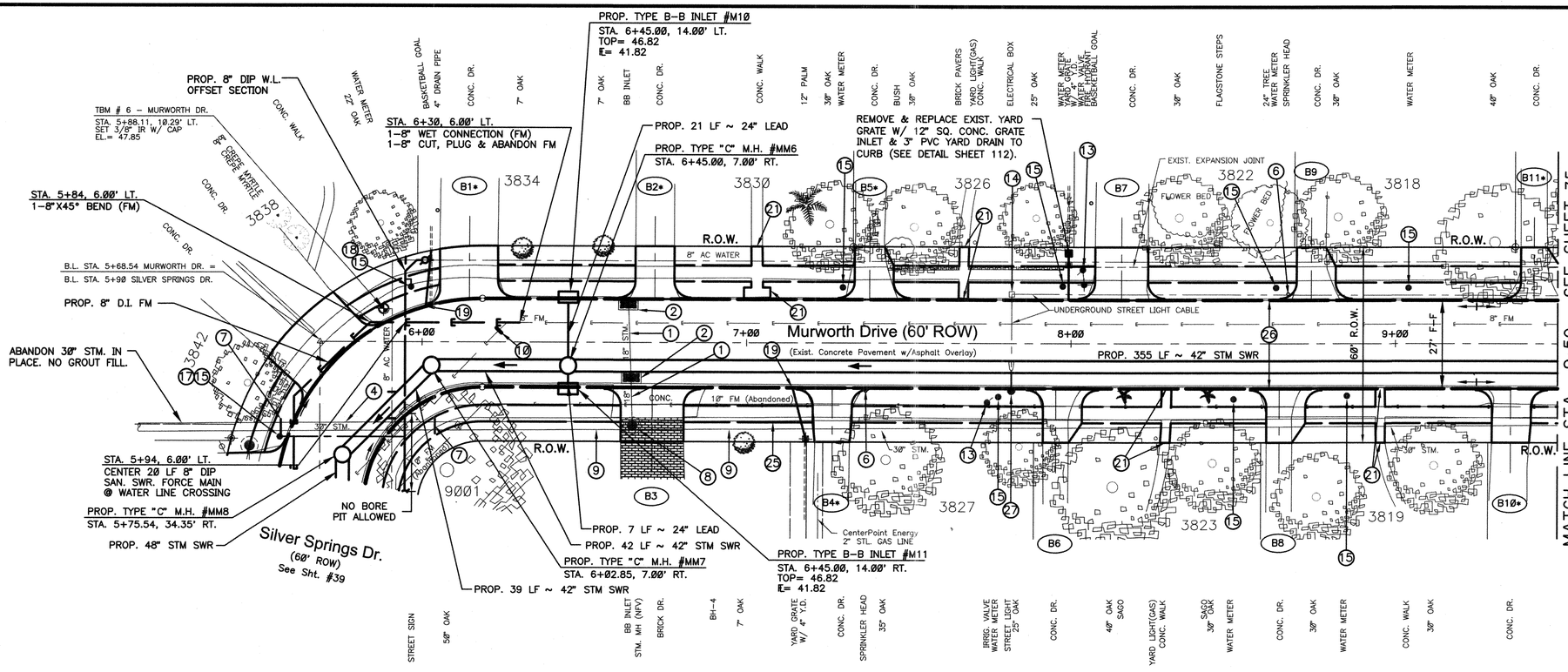
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Latma Drive
Sta. 24+00 to End

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	
DRAWING SCALE	
VERT: 1"=2' HORZ: 1"=20'	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	
SHEET No: 33 OF 122	

PUBLIC WORKS AND ENGINEERING (AND) FILED
48978
LICENSE NUMBER
REGISTERED
TEXAS



NOTES:

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3. FOR EXISTING UNDERGROUND UTILITIES NOTES (SEE SHEET 3)
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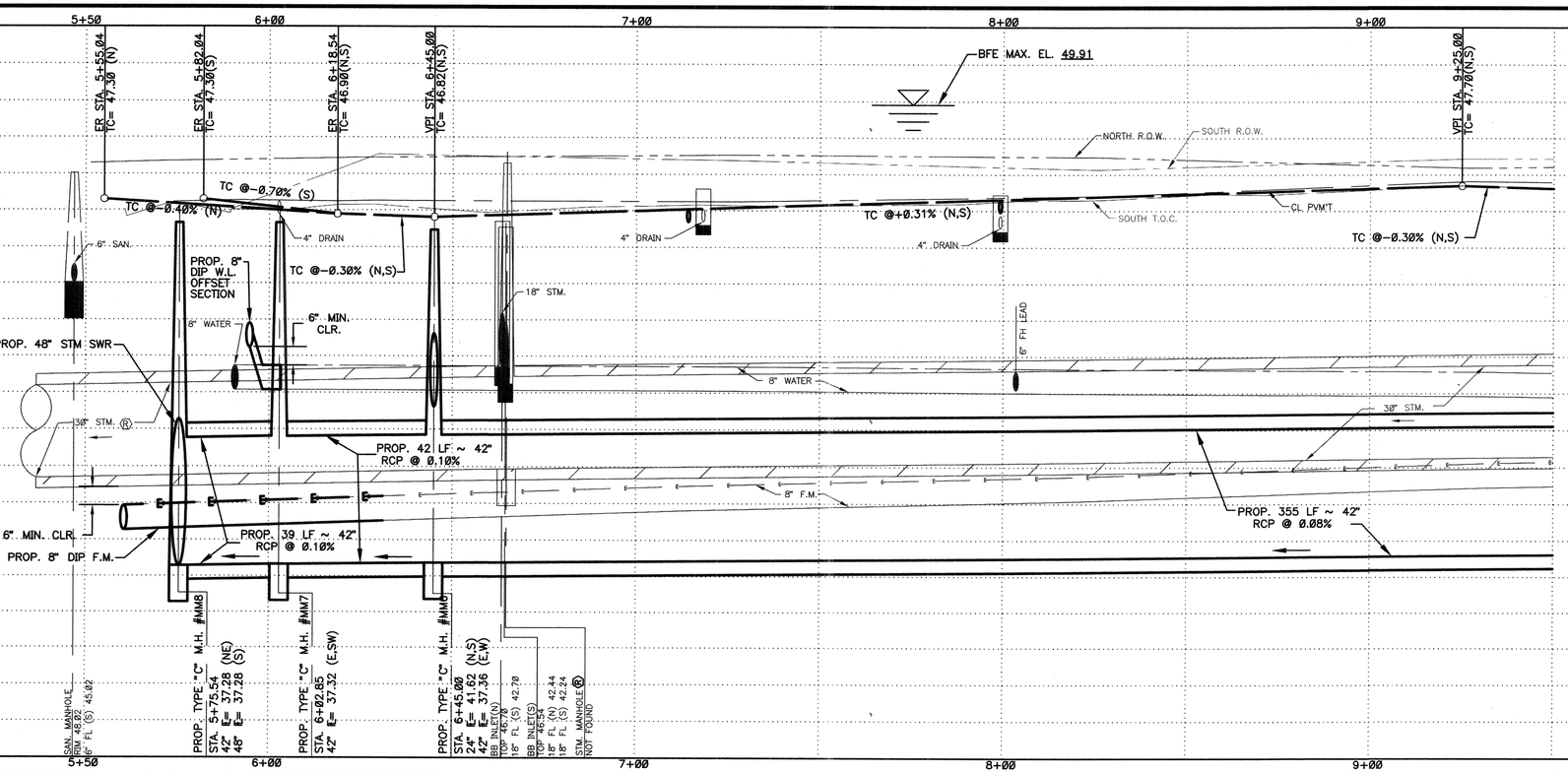
* SEE DRIVEWAY TABLE SHEET 121

TBM'S:

TBM 5: Set 3/8" IR with Cap located behind the curb at the southeast corner of Murworth Drive and Kapri Lane, Murworth Drive Sta. 12+82.12, 15.39' right, Elev. 46.72.

TBM 6: Set 3/8" IR with Cap located behind the curb on the northwest side of the intersection of Murworth Drive and Silver Springs Drive at Murworth Drive Sta. 5+88.11, 10.29' left, Elev. 47.85.



STANDARD PROFILE LEGEND

CENTER LINE OF R.O.W. ——————
PROPERTY LINE N & E ———— — ———
PROPERTY LINE S & W ———— — ———
DITCH OR TOP OF CURB N&E ———— — ———
DITCH OR TOP OF CURB S&W ————

MK.	DESCRIPTION	DATE	DWN.	CHK.

REVISIONS

PRIVATE UTILITY LINES SHOWN
AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.

Centerpoint Energy Power Facilities — Date: 11/3/11
(Approved only for crossing underground ductlines, unless otherwise noted.)
Valid At Time Of Review Only

Approved for AT&T Texas/SWBT underground conduit facilities only. — Date: 11-1-11
Signature valid for one year.

Centerpoint Energy Gas Facilities — Date: 11/3/11
(Centerpoint service lines are not shown.)

Cable Company — Date:

HDR | CLAUNCH & MILLER Engineering Consultants
4635 Southwest Freeway, Suite 1000• Houston, Texas 77027
(713) 622-9264• Fax (713) 622-9265• www.hdrinc.com
HDR Engineering Inc. Texas Reg. No. F-754

JOHN D. RUDLOFF
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Suite 1000
Houston, Texas 77027
(713) 622-9264
Fax (713) 622-9265

STATE OF TEXAS — JOHN D. RUDLOFF — 83386 — LICENSED PROFESSIONAL ENGINEER — 10/19/11

SURVEYED BY: Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051	Dwn By: P. Hopkins
Date: May 2011	Chkd By: D. Jorgensen

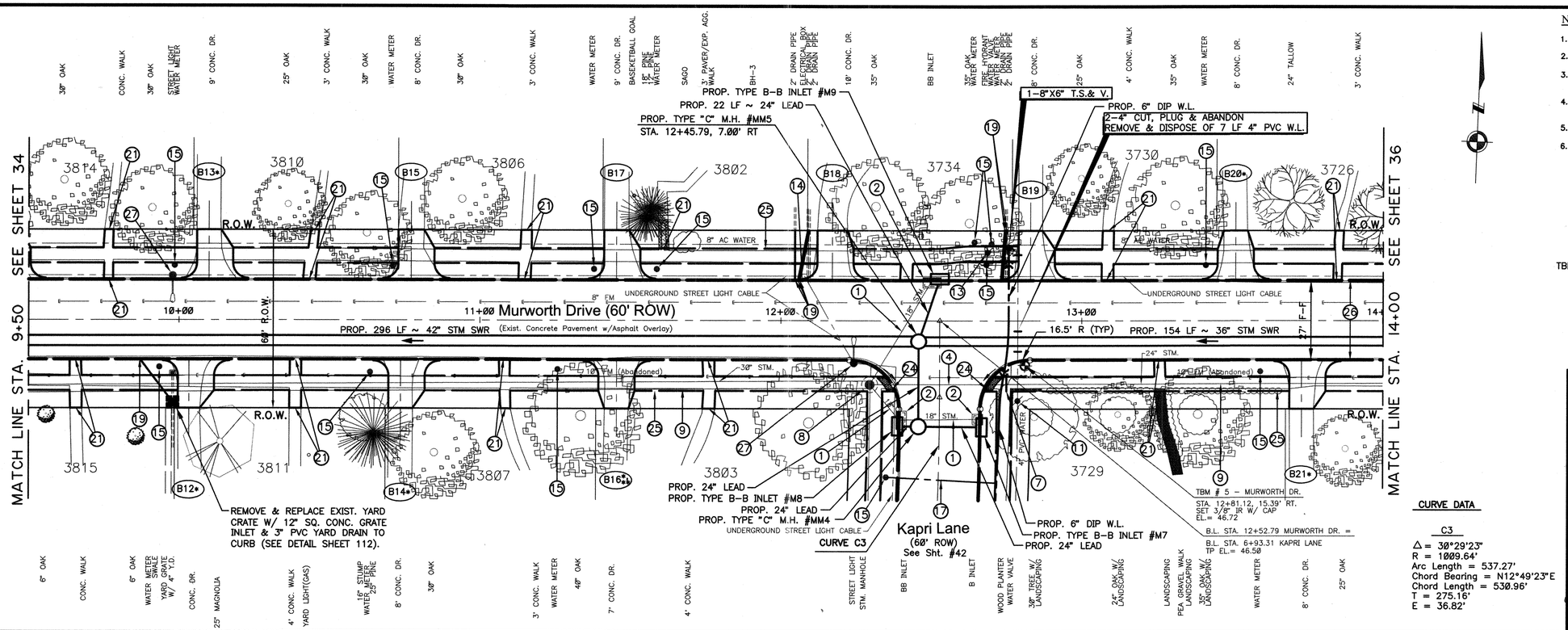
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

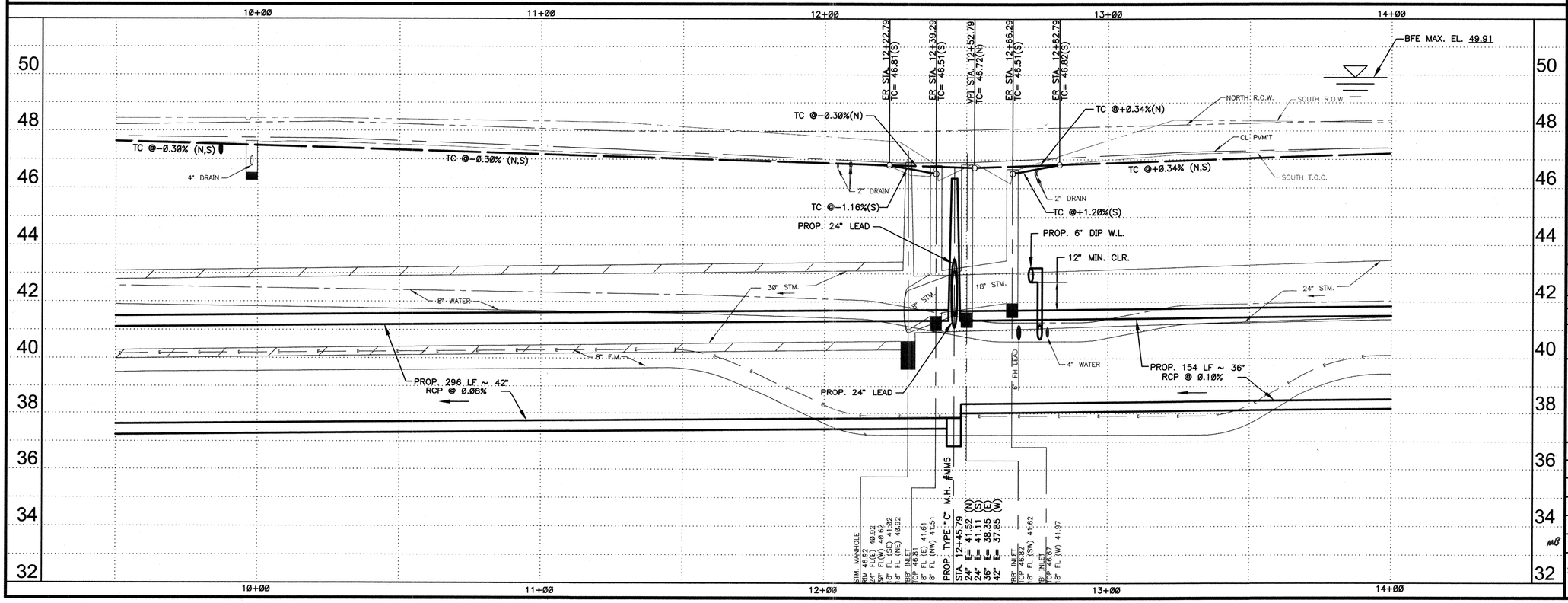
City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Murworth Drive
Sta. 5+50 to Sta. 9+50

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	
DRAWING SCALE	
VERT: 1"=2' HORZ: 1"=20'	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	AB
SHEET No: 34 OF 122	

PUBLIC WORKS AND ENGINEERING — (NAF) FILED — 48978 — NUMBER — TEXAS





NOTES:

1. SEE SHEET 4 FOR KEYED NOTE CALLOUTS
2. SEE SHEETS 5,6, &7 FOR HORIZONTAL CONTROLS
3. FOR EXISTING UNDERGROUND UTILITIES NOTES (SEE SHEET 3)
4. ALL PAVING OFFSETS ARE SYMMETRICAL ABOUT THE BASELINE UNLESS OTHERWISE NOTED.
5. SEE SHEET 121 FOR DRIVEWAY TABLE
6. ALL ELEVATIONS SHOWN IN HOUSTORM CALCULATIONS ARE IN TSARP DATUM (1988 DATUM, 2001 ADJ.). SURVEY AND PLAN ELEVATIONS ARE IN NSRS (CORS) DATUM; EQUATION TO TIE FROM NSRS (CORS) DATUM TO TSARP DATUM IS: TSARP EL. (ft) = NSRS EL. (ft) - 0.21

TBM'S:

TBM 5: Set 3/8" IR with Cap located behind the curb at the southeast corner of Murworth Drive and Kapri Lane, Murworth Drive Sta. 12+82.12, 15.39' right, Elev. 46.72.

* SEE DRIVEWAY TABLE (SHEET 121)
** SEE NOTE ON DRIVEWAY TABLE (SHEET 121)

CURVE DATA

C3
Δ = 30°29'23"
R = 1009.64'
Arc Length = 537.27'
Chord Bearing = N12°49'23"E
Chord Length = 530.96'
T = 275.16'
E = 36.82'

STANDARD PROFILE LEGEND

CENTER LINE OF R.O.W.
PROPERTY LINE N & E
PROPERTY LINE S & W
DITCH OR TOP OF CURB N&E
DITCH OR TOP OF CURB S&W

MK.	DESCRIPTION	DATE	DWN.	CHK.

REVISIONS

PRIVATE UTILITY LINES SHOWN
AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.

Centerpoint Energy Power Facilities Date: 11/3/11
(Approved only for crossing underground ductlines, unless otherwise noted.)
Valid At Time Of Review Only

Approved for AT&T Texas/SWBT underground conduit facilities only. Date: 11-1H1
Signature valid for one year.

Centerpoint Energy Gas Facilities Date: 11/3/11
(Centerpoint service lines are not shown.)

Cable Company Date:

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Fax (713) 622-9265

STATE OF TEXAS · JOHN D. RUDLOFF · 83386 · LICENSED PROFESSIONAL ENGINEER
10/9/11

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 | Dwn By: P. Hopkins
Date: May 2011 | Chkd By: D. Jorgensen

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Murworth Drive
Sta. 9+50 to Sta.14+00

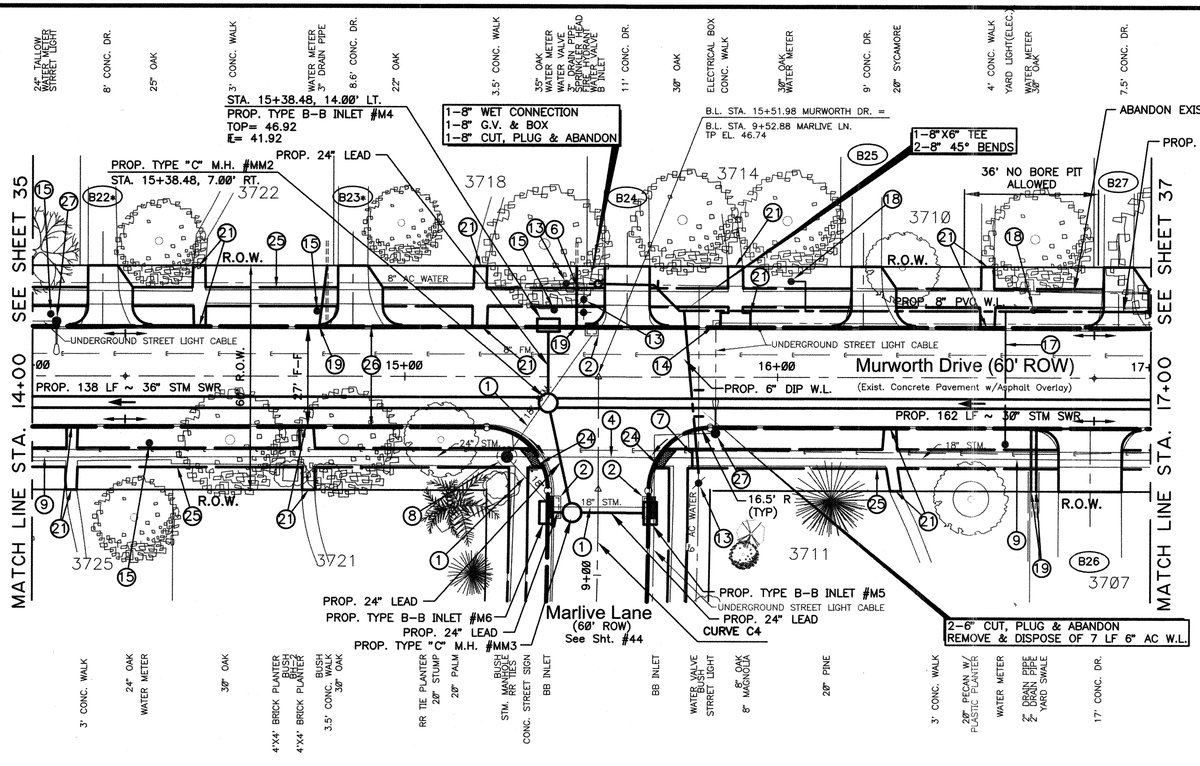
WBS NO.
N-000378-0002-4

DRAWING SCALE
VERT: 1"=2' HORZ: 1"=20'

CITY OF HOUSTON PM
MARK BOARD, P.E.

SHEET No: 35 OF 122

FOR CITY OF HOUSTON USE ONLY
PUBLIC WORKS AND ENGINEERING · AMF FILED · 48978 · NUMBER · TEXAS



TBM'S:

TBM 5: Set 3/8" IR with Cap located behind the curb at the southeast corner of Murworth Drive and Kapri Lane, Murworth Drive Sta. 12+82.12, 15.39' right, Elev. 46.72.

TBM 11: Cut X in concrete sidewalk located at the southeast corner of Murworth Drive and Marlive Lane, Murworth Dr. Sta. 15+70.92, 21.68' right, elev. 47.16.

NOTES:

1. SEE SHEET 4 FOR KEYED NOTE CALLOUTS
2. SEE SHEETS 5,6, &7 FOR HORIZONTAL CONTROLS
3. FOR EXISTING UNDERGROUND UTILITIES NOTES (SEE SHEET 3)
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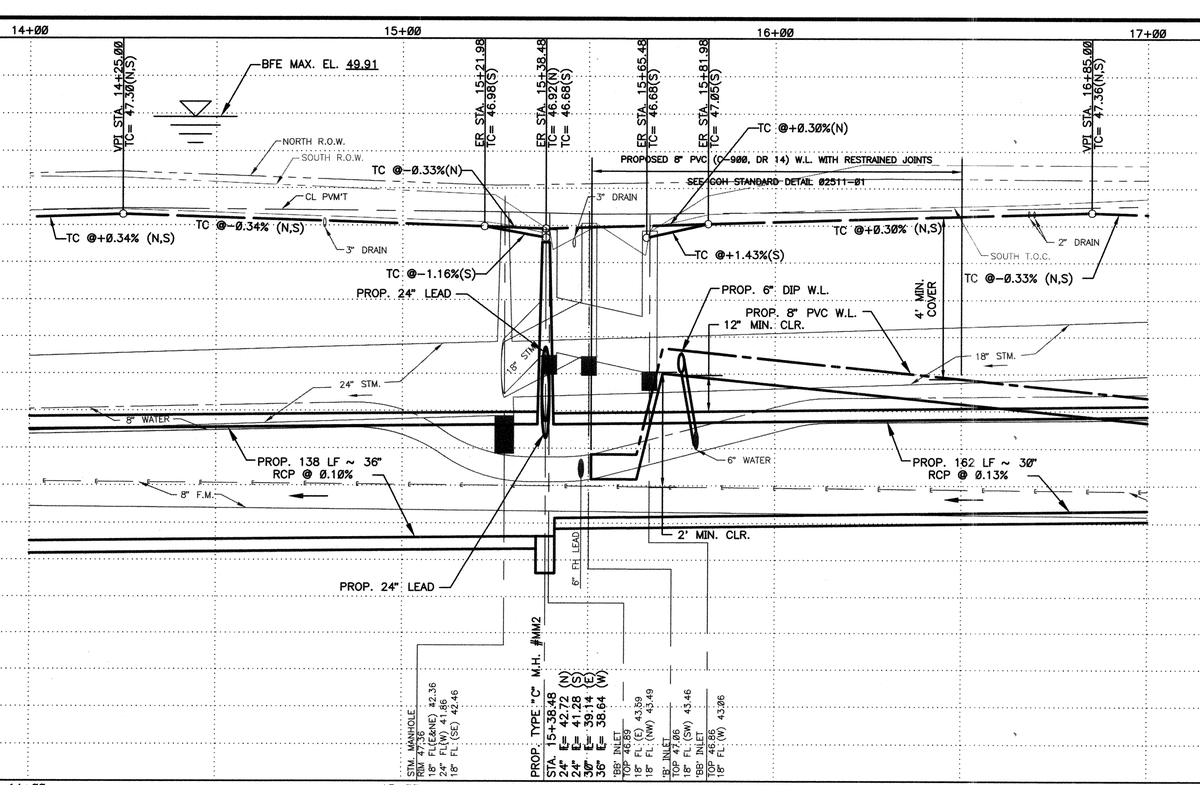
* SEE DRIVEWAY TABLE (SHEET 121)

CURVE DATA

C4
Δ = 30°29'23"
R = 1302.89'
Arc Length = 693.33'
Chord Bearing = N12°49'23"E
Chord Length = 685.17'
T = 355.08'
E = 47.52'



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SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 | Dwn By: P. Hopkins
Date: May 2011 | Chkd By: D. Jorgensen

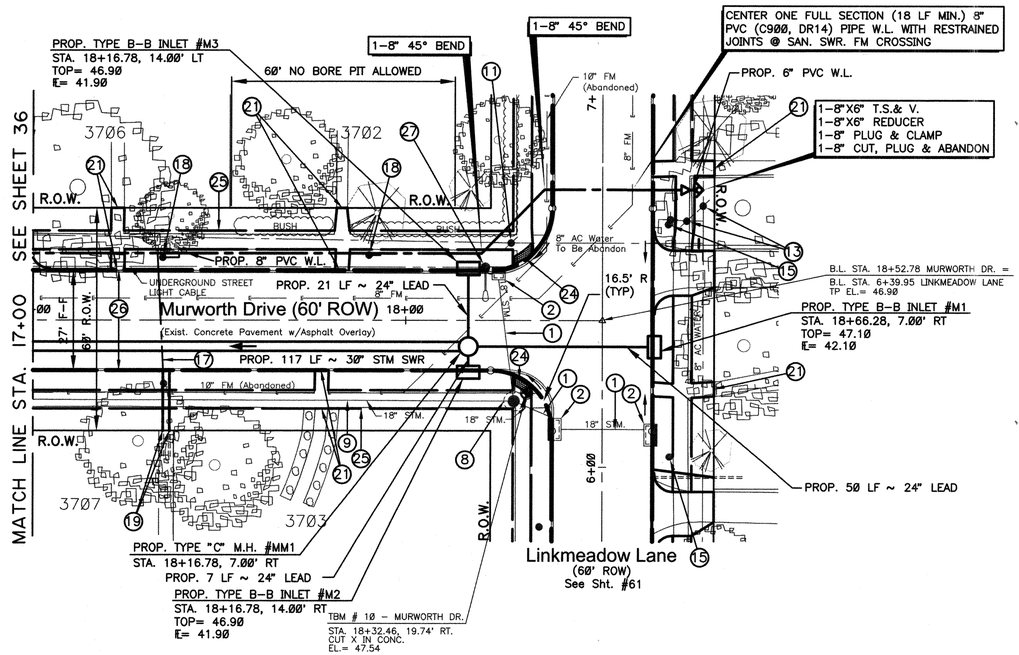
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

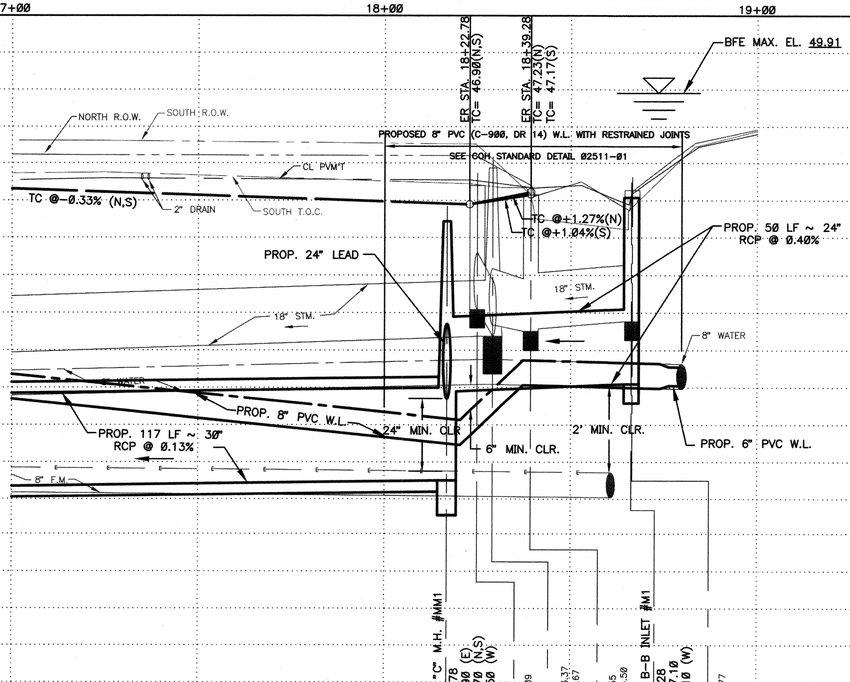
City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Murworth Drive
Sta. 14+00 to 17+00

WBS NO.
N-000378-0002-4
DRAWING SCALE
VERT: 1"=2' HORZ: 1"=20'
CITY OF HOUSTON PM
MARK BOARD, P.E.
SHEET No: 36 OF 122

FOR CITY OF HOUSTON USE ONLY





NOTES:

1. SEE SHEET 4 FOR KEYED NOTE CALLOUTS
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3. FOR EXISTING UNDERGROUND UTILITIES NOTES (SEE SHEET 3)
4. ALL PAVING OFFSETS ARE SYMMETRICAL ABOUT THE BASELINE UNLESS OTHERWISE NOTED.
5. SEE SHEET 121 FOR DRIVEWAY TABLE
6. ALL ELEVATIONS SHOWN IN HOUSTORM CALCULATIONS ARE IN TSARP DATUM (1988 DATUM, 2001 ADJ.). SURVEY AND PLAN ELEVATIONS ARE IN NSRS (CORS) DATUM; EQUATION TO TIE FROM NSRS (CORS) DATUM TO TSARP DATUM IS:
   TSARP EL. (ft) = NSRS EL. (ft) - 0.21

TBM'S:

TBM 10: Cut X in concrete sidewalk located in southwest corner of Murworth Drive and Linkmeadow Lane at Murworth Drive Sta. 18+32.46, 19.74' right, Elev. 47.54.

STANDARD PROFILE LEGEND

CENTER LINE OF R.O.W.
PROPERTY LINE N & E
PROPERTY LINE S & W
DITCH OR TOP OF CURB N&E
DITCH OR TOP OF CURB S&W

MK.	DESCRIPTION	DATE	DWN.	CHK.

REVISIONS

PRIVATE UTILITY LINES SHOWN
AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.

Centerpoint Energy Power Facilities Date: 11/3/11
(Approved only for crossing underground ductlines, unless otherwise noted.)
Valid At Time Of Review Only

Approved for AT&T Texas/SWBT underground conduit facilities only. Date: 11-1-11
Signature valid for one year.

Centerpoint Energy Gas Facilities Date: 11/3/11
(Centerpoint service lines are not shown.)

Cable Company Date:

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Fax (713) 622-9265

STATE OF TEXAS — JOHN D. RUDLOFF — 83386 — LICENSED PROFESSIONAL ENGINEER — 10/19/11

SURVEYED BY: Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 — Dwn By: P. Hopkins
Date: May 2011 — Chkd By: D. Jorgensen

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Murworth Drive
Sta. 17+00 to End

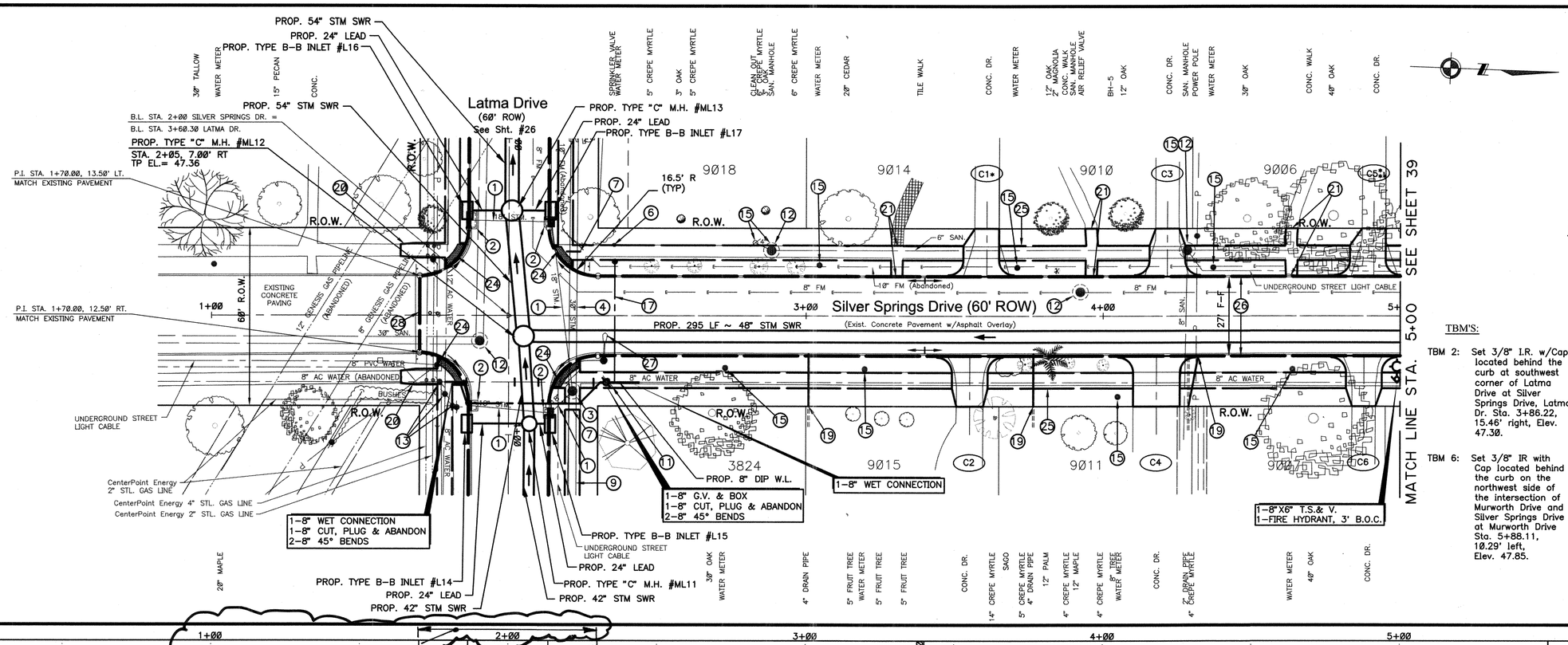
WBS NO.
N-000378-0002-4

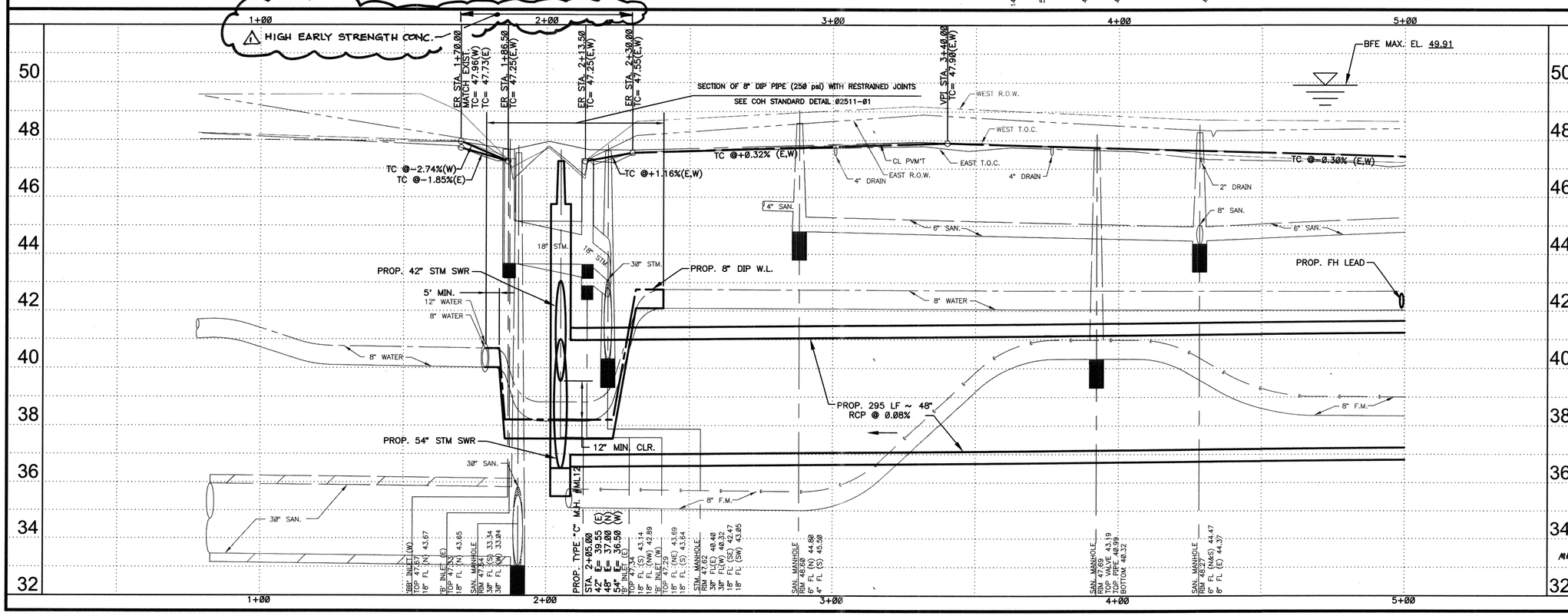
DRAWING SCALE
VERT: 1"=2' HORZ: 1"=20'

CITY OF HOUSTON PM
MARK BOARD, P.E.

FOR CITY OF HOUSTON USE ONLY
PUBLIC WORKS AND ENGINEERING — 48978 — LICENSED — TEXAS — ENGINEER — FILED

SHEET No: 37 OF 122





NOTES:

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   TSARP EL. (ft) = NSRS EL. (ft) – 0.21

PPCA
(SEE SHEETS 13 AND 14 FOR APPROXIMATE LIMITS)

TBM'S:

TBM 2: Set 3/8" I.R. w/Cap located behind the curb at southwest corner of Latma Drive at Silver Springs Drive, Latma Dr. Sta. 3+86.22, 15.46' right, Elev. 47.30.

TBM 6: Set 3/8" IR with Cap located behind the curb on the northwest side of the intersection of Murworth Drive and Silver Springs Drive at Murworth Drive Sta. 5+88.11, 10.29' left, Elev. 47.85.

* SEE DRIVEWAY TABLE (SHEET 121)
** SEE NOTE ON DRIVEWAY TABLE (SHEET 121)

STANDARD PROFILE LEGEND

CENTER LINE OF R.O.W.
PROPERTY LINE N & E
PROPERTY LINE S & W
DITCH OR TOP OF CURB N&E
DITCH OR TOP OF CURB S&W

MK.	DESCRIPTION	DATE	DWN.	CHK.
2	ADDED PPCA LIMITS	04/12	AS	HW
1	DEFINED LIMITS OF HIGH EARLY STRENGTH CONC.	12/6	DP	HW

REVISIONS

PRIVATE UTILITY LINES SHOWN
AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.

Centerpoint Energy Power Facilities — Date: 11/3/11
(Approved only for crossing underground ductlines, unless otherwise noted.)
Valid At Time Of Review Only

Approved for AT&T Texas/SWBT underground conduit facilities only. Signature valid for one year. — Date: 11-1-11

Centerpoint Energy Gas Facilities — Date: 11/3/11
(Centerpoint service lines are not shown.)

Cable Company — Date:

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STATE OF TEXAS — JOHN D. RUDLOFF — 83386 — LICENSED PROFESSIONAL ENGINEER — 10/10/11

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 — Dwn By: P. Hopkins
Date: May 2011 — Chkd By: D. Jorgensen

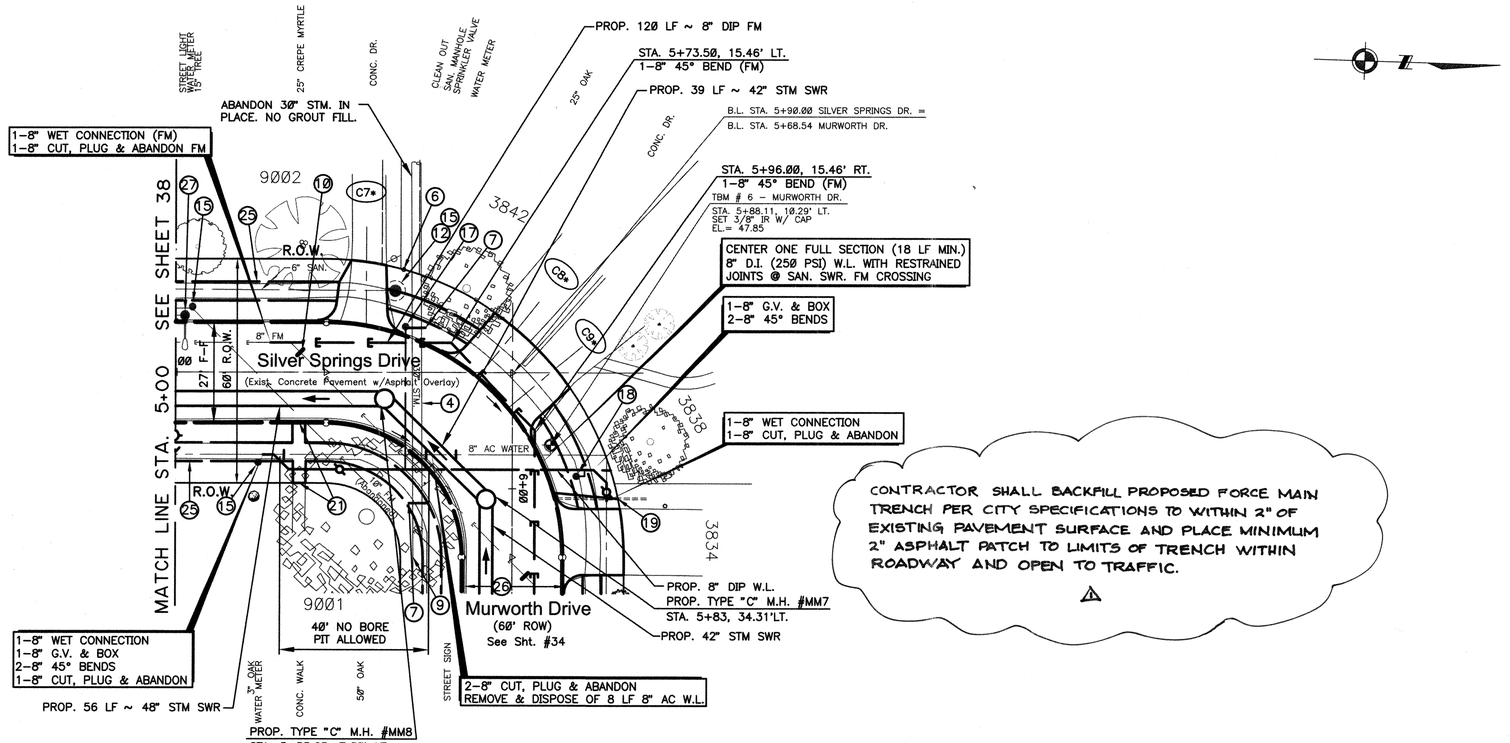
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

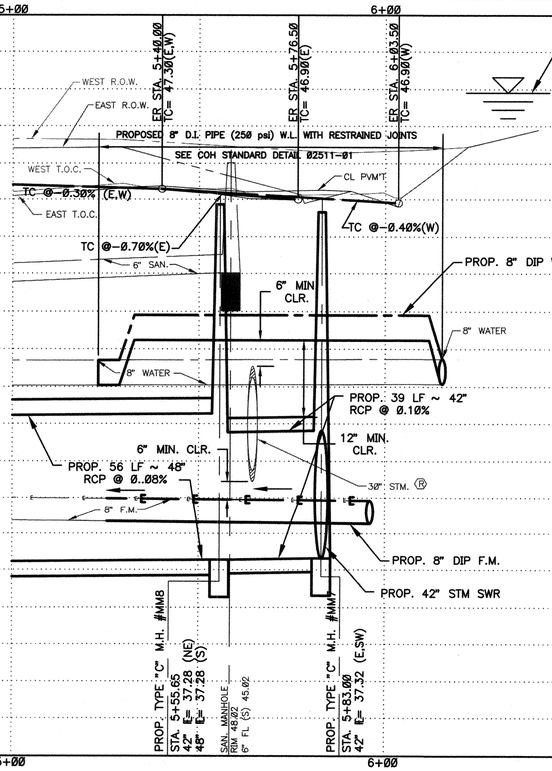
City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Silver Springs Drive
Sta. 1+00 to Sta. 5+00

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	
DRAWING SCALE	
VERT: 1"=2' HORZ: 1"=20'	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	
SHEET No: 38 OF 122	

PUBLIC WORKS AND ENGINEERING — ENGINEERING FILED — 48978 — REGISTERED — TEXAS





NOTES:

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TBM'S:

TBM 6: Set 3/8" IR with Cap located behind the curb on the northwest side of the intersection of Murworth Drive and Silver Springs Drive at Murworth Drive Sta. 5+88.11, 10.29' left, Elev. 47.85.

* SEE DRIVEWAY TABLE (SHEET 121)

STANDARD PROFILE LEGEND

CENTER LINE OF R.O.W. ——————
PROPERTY LINE N & E ——— — ———
PROPERTY LINE S & W ——— — ———
DITCH OR TOP OF CURB N&E ——— — ———
DITCH OR TOP OF CURB S&W ——————

MK.	DESCRIPTION	DATE	DWN.	CHK.
1	ADDED TEMP. ASPHALT NOTE FOR FORCE MAIN	11/3/11	DFJ	MBH

REVISIONS

PRIVATE UTILITY LINES SHOWN
AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.

Centerpoint Energy Power Facilities Date: 11/3/11
(Approved only for crossing underground ductlines, unless otherwise noted.)
Valid At Time Of Review Only

Approved for AT&T Texas/SWBT underground conduit facilities only. Date: 11-1-11
Signature valid for one year.

Centerpoint Energy Gas Facilities Date: 11/3/11
(Centerpoint service lines are not shown.)

Cable Company Date:

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STATE OF TEXAS — JOHN D. RUDLOFF — 83386 — LICENSED PROFESSIONAL ENGINEER — 10/31/11

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 | Dwn By: P. Hopkins
Date: May 2011 | Chkd By: D. Jorgensen

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

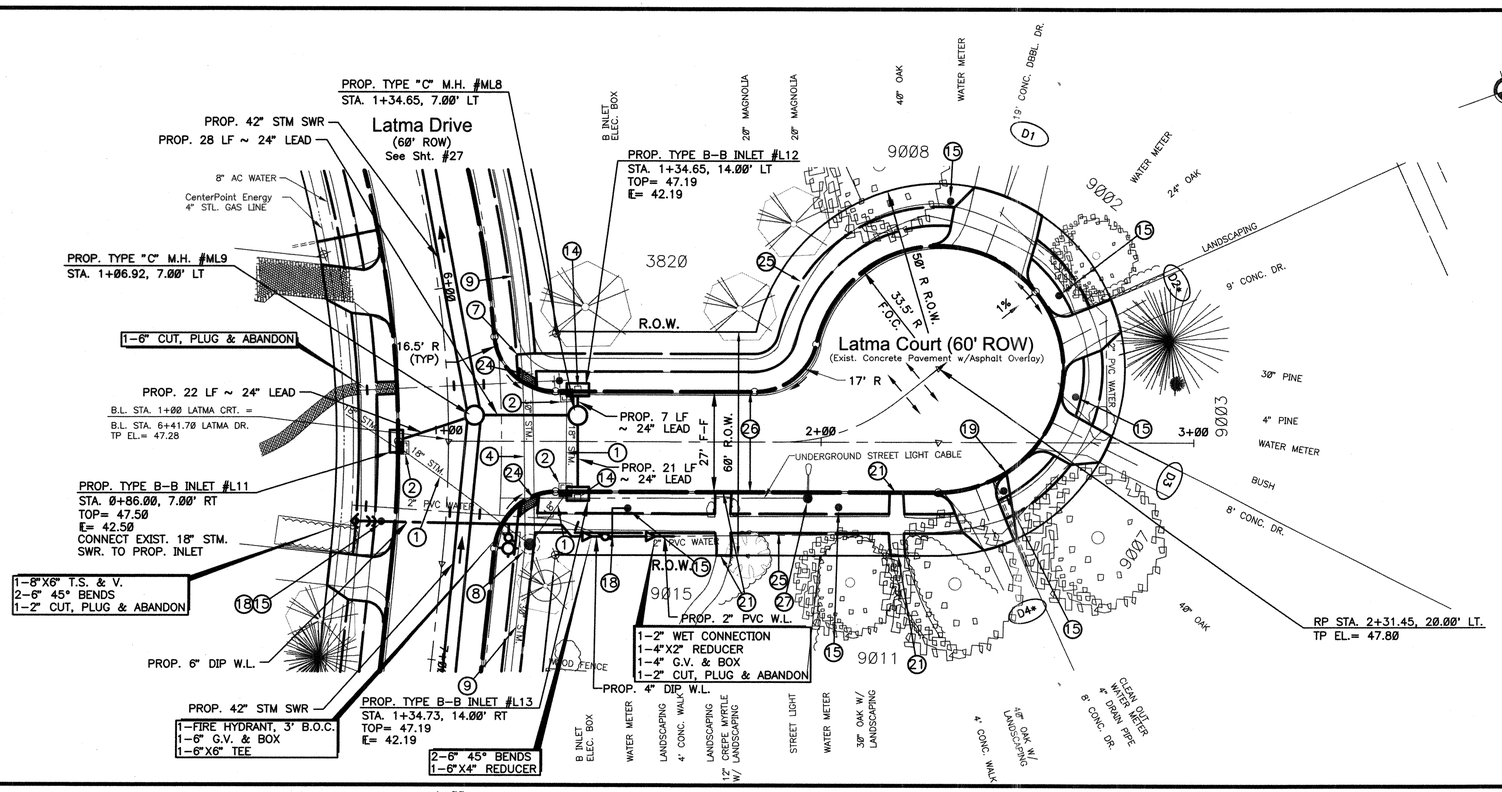
City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Silver Springs Drive
Sta. 5+00 to End

WBS NO.
N-000378-0002-4
DRAWING SCALE
VERT: 1"=2' HORZ: 1"=20'
CITY OF HOUSTON PM
MARK BOARD, P.E.
MB

SHEET No: 39 OF 122

FOR CITY OF HOUSTON USE ONLY
PUBLIC WORKS AND ENGINEERING — REVIEWED AND FILED — 48978 — NUMBER — TEXAS



NOTES:

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TSARP EL. (ft) = NSRS EL. (ft) – 0.21

TBM'S:

TBM 3: Set 3/8" IR w/Cap located behind the curb on south side of Latma Drive at the Latma Court intersection, Latma Dr. Sta. 6+47.48, 16.34' right, Elev. 48.04

* SEE DRIVEWAY TABLE (SHEET 121)

STANDARD PROFILE LEGEND

CENTER LINE OF R.O.W. ——————
PROPERTY LINE N & E ———— — — ————
PROPERTY LINE S & W ———— — — ————
DITCH OR TOP OF CURB N&E ———— — ————
DITCH OR TOP OF CURB S&W ———— — ————

MK.	DESCRIPTION	DATE	DWN.	CHK.

REVISIONS

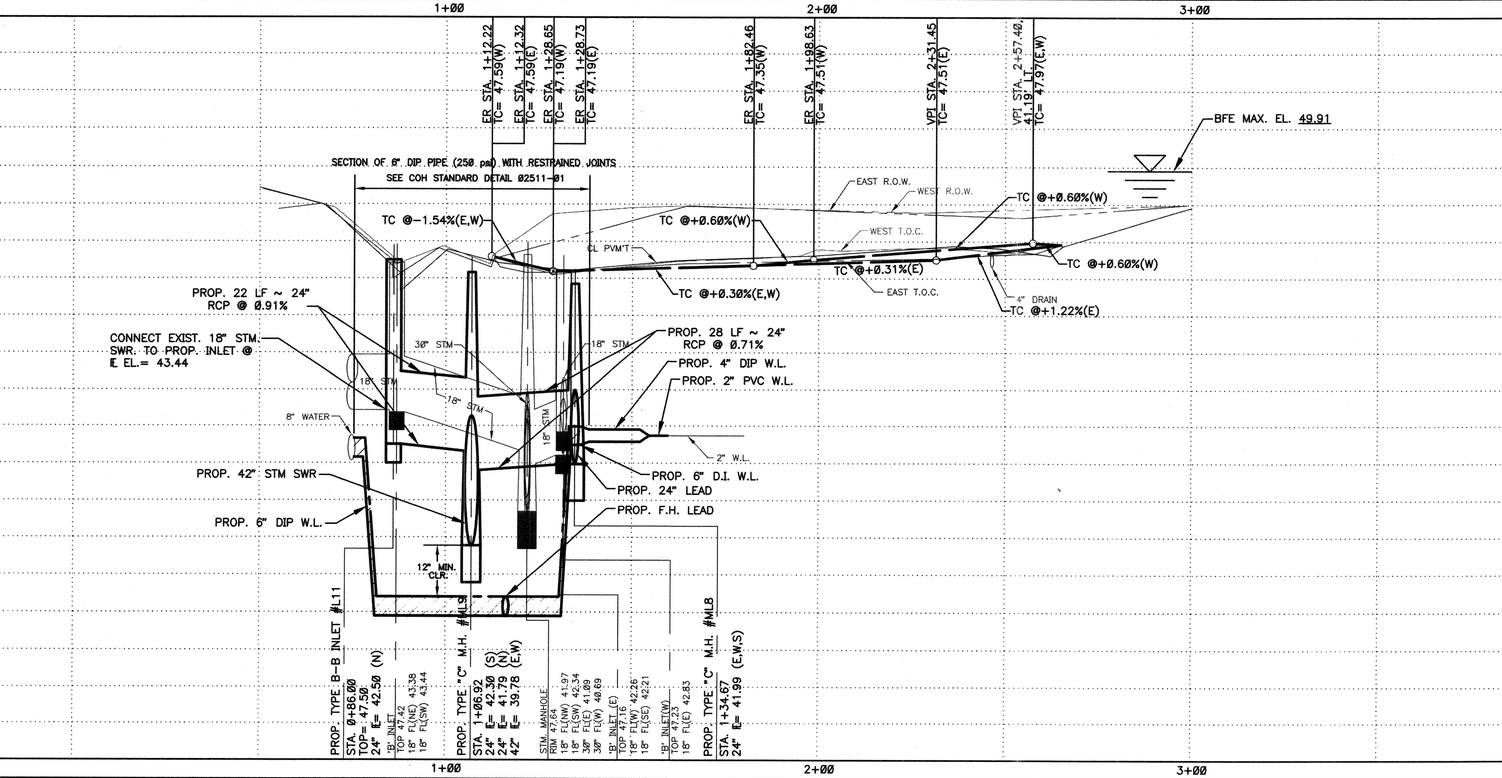
PRIVATE UTILITY LINES SHOWN
AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.

Centerpoint Energy Power Facilities Date: 11/3/11
(Approved only for crossing underground ductlines, unless otherwise noted.)
Valid At Time Of Review Only

AT&T Texas/SWBT Date: 11-4-11
Approved for AT&T Texas/SWBT underground conduit facilities only.
Signature valid for one year.

Centerpoint Energy Gas Facilities Date: 11/3/11
(Centerpoint service lines are not shown.)

Cable Company Date:



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STATE OF TEXAS — JOHN D. RUDLOFF — 83386 — LICENSED PROFESSIONAL ENGINEER — 10/19/11

SURVEYED BY: Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 Dwn By: P. Hopkins
Date: May 2011 Chkd By: D. Jorgensen

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

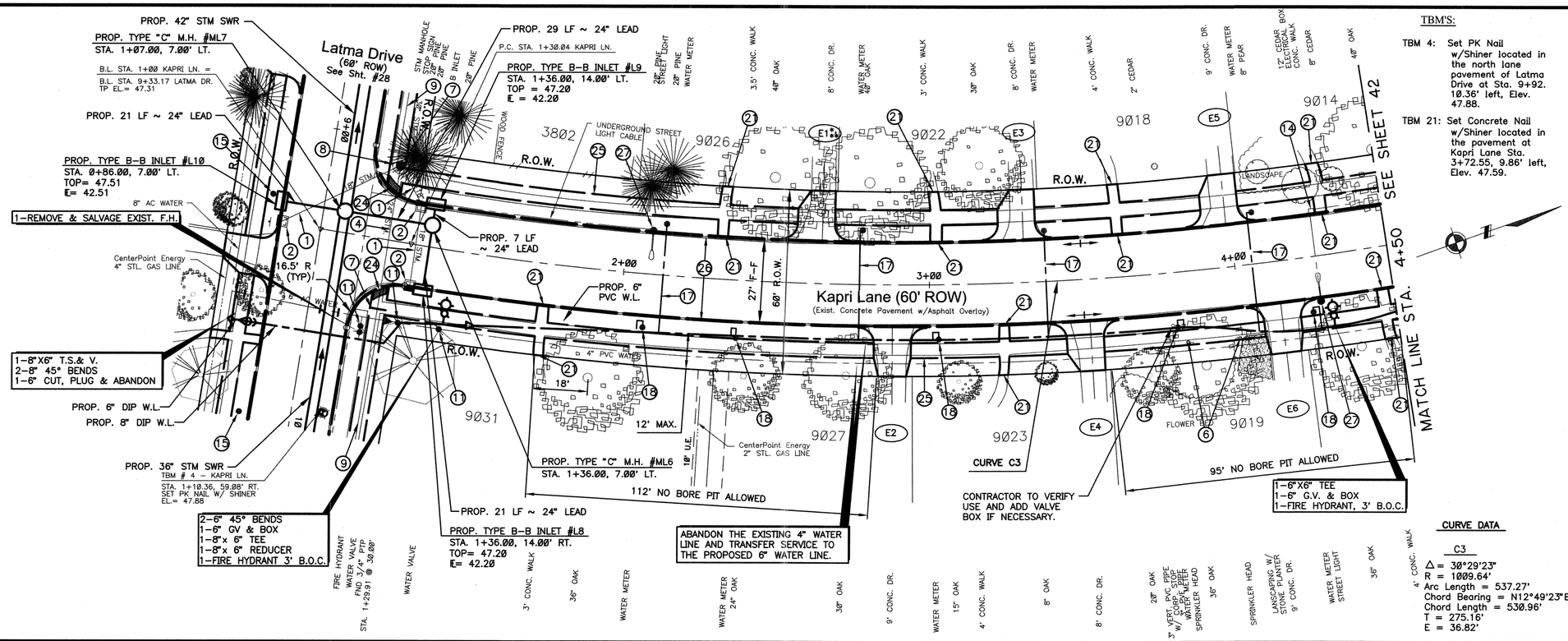
City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Latma Court
Sta. 1+00 to End

WBS NO. N-000378-0002-4
DRAWING SCALE
VERT: 1"=2' HORZ: 1"=20'
CITY OF HOUSTON PM
MARK BOARD, P.E.

FOR CITY OF HOUSTON USE ONLY
PUBLIC WORKS AND ENGINEERING — ACCEPTED AND FILED — 48978 — LICENSE NUMBER — TEXAS

SHEET No: 40 OF 122



TBM'S:

TBM 4: Set PK Nail w/Shiner located in the north lane pavement of Latma Drive at Sta. 9+92. 10.36' left, Elev. 47.88.

TBM 21: Set Concrete Nail w/Shiner located in the pavement at Kapri Lane Sta. 3+72.55, 9.86' left, Elev. 47.59.

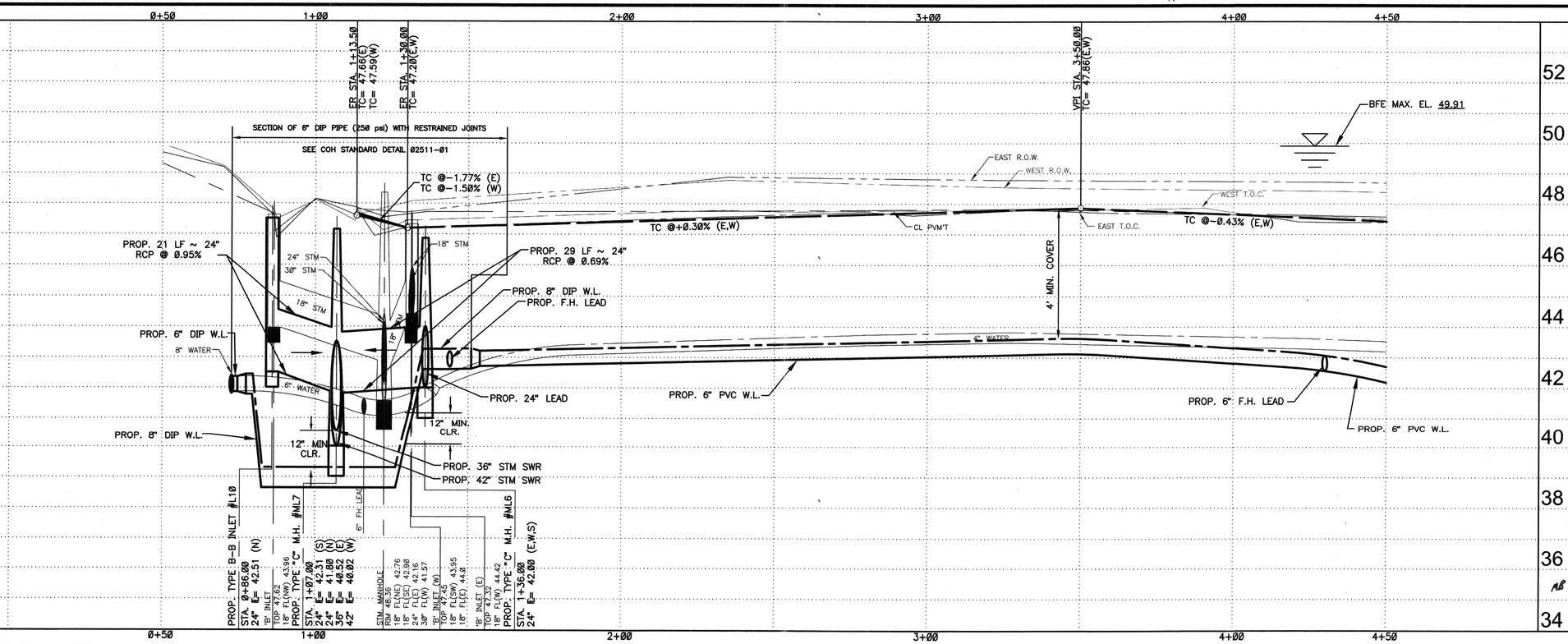
NOTES:

1. SEE SHEET 4 FOR KEYED NOTE CALLOUTS
2. SEE SHEETS 5,6, &7 FOR HORIZONTAL CONTROLS
3. FOR EXISTING UNDERGROUND UTILITIES NOTES (SEE SHEET 3)
4. ALL PAVING OFFSETS ARE SYMMETRICAL ABOUT THE BASELINE UNLESS OTHERWISE NOTED.
5. SEE SHEET 121 FOR DRIVEWAY TABLE
6. ALL ELEVATIONS SHOWN IN HOUSTORM CALCULATIONS ARE IN TSARP DATUM (1988 DATUM, 2001 ADJ.). SURVEY AND PLAN ELEVATIONS ARE IN NSRS (CORS) DATUM; EQUATION TO TIE FROM NSRS (CORS) DATUM TO TSARP DATUM IS: TSARP EL. (ft) = NSRS EL. (ft) – 0.21

* SEE DRIVEWAY TABLE (SHEET 121)
** SEE NOTE ON DRIVEWAY TABLE (SHEET 121)

CURVE DATA

C3
Δ = 30°29'23"
R = 1009.64'
Arc Length = 537.27'
Chord Bearing = N12°49'23"E
Chord Length = 530.96'
T = 275.16'
E = 36.82'



STANDARD PROFILE LEGEND

CENTER LINE OF R.O.W.
PROPERTY LINE N & E
PROPERTY LINE S & W
DITCH OR TOP OF CURB N&E
DITCH OR TOP OF CURB S&W

MK.	DESCRIPTION	DATE	DWN.	CHK.

REVISIONS

PRIVATE UTILITY LINES SHOWN
AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.

Centerpoint Energy Power Facilities — Date: 11/3/11
(Approved only for crossing underground ductlines, unless otherwise noted.)
Valid At Time Of Review Only

Approved for AT&T Texas/SWBT underground conduit facilities only. Signature valid for one year. — Date: 11-1-11

Centerpoint Energy Gas Facilities — Date: 11/3/11
(Centerpoint service lines are not shown.)

Cable Company — Date:

HDR | CLAUNCH & MILLER
Engineering Consultants
4635 Southwest Freeway, Suite 1000• Houston, Texas 77027
(713) 622-9264• Fax (713) 622-9265• www.hdrinc.com
HDR Engineering Inc. Texas Reg. No. F-754

JOHN D. RUDLOFF
4635 Southwest Freeway
Suite 1000
Houston, Texas 77027
(713) 622-9264
Fax (713) 622-9265

STATE OF TEXAS — JOHN D. RUDLOFF — 83386 — LICENSED PROFESSIONAL ENGINEER — 10/19/11

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 — Dwn By: P. Hopkins
Date: May 2011 — Chkd By: D. Jorgensen

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Kapri Lane
Sta. 1+00 to Sta. 4+50

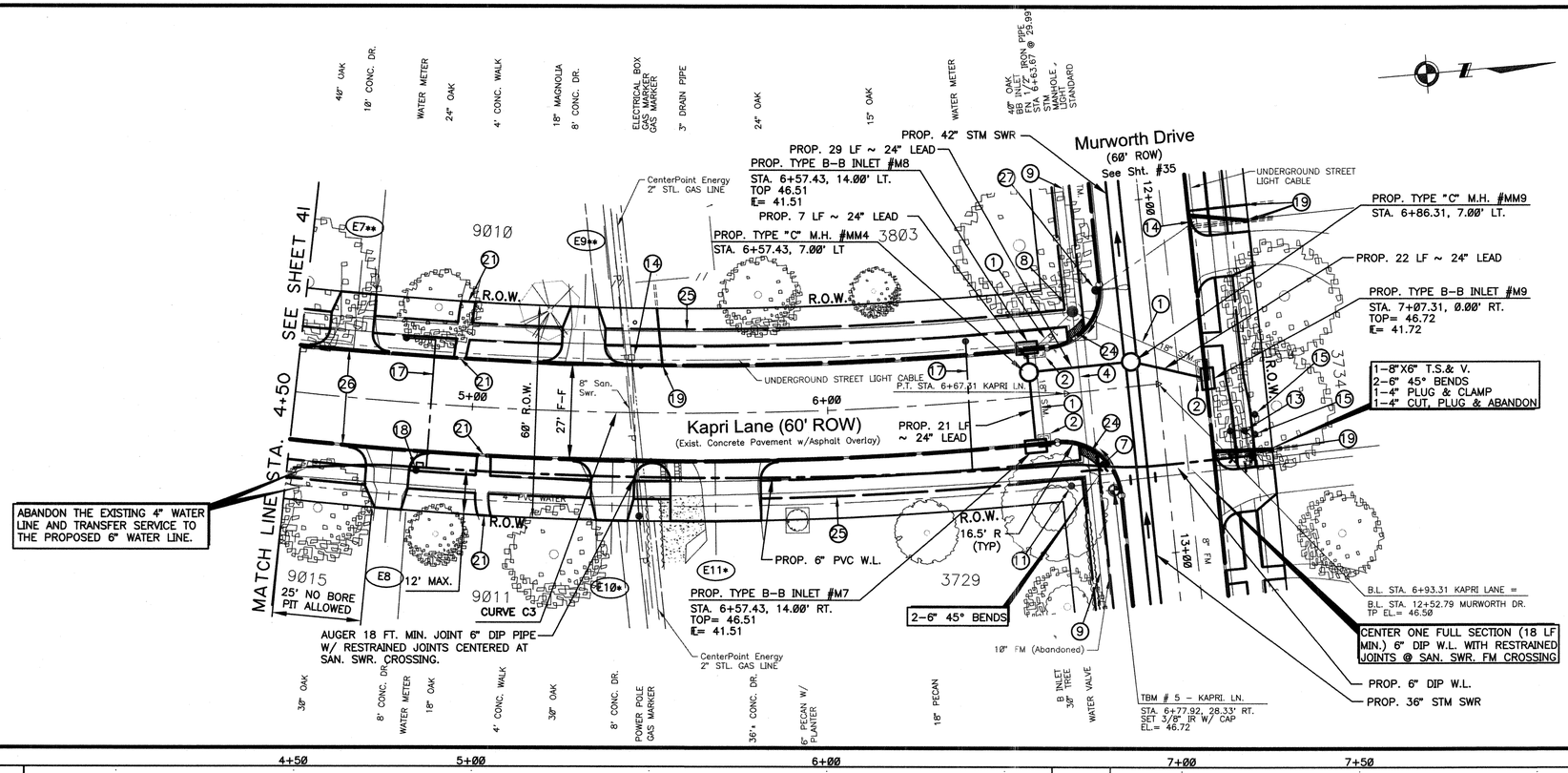
WBS NO.
N-000378-0002-4

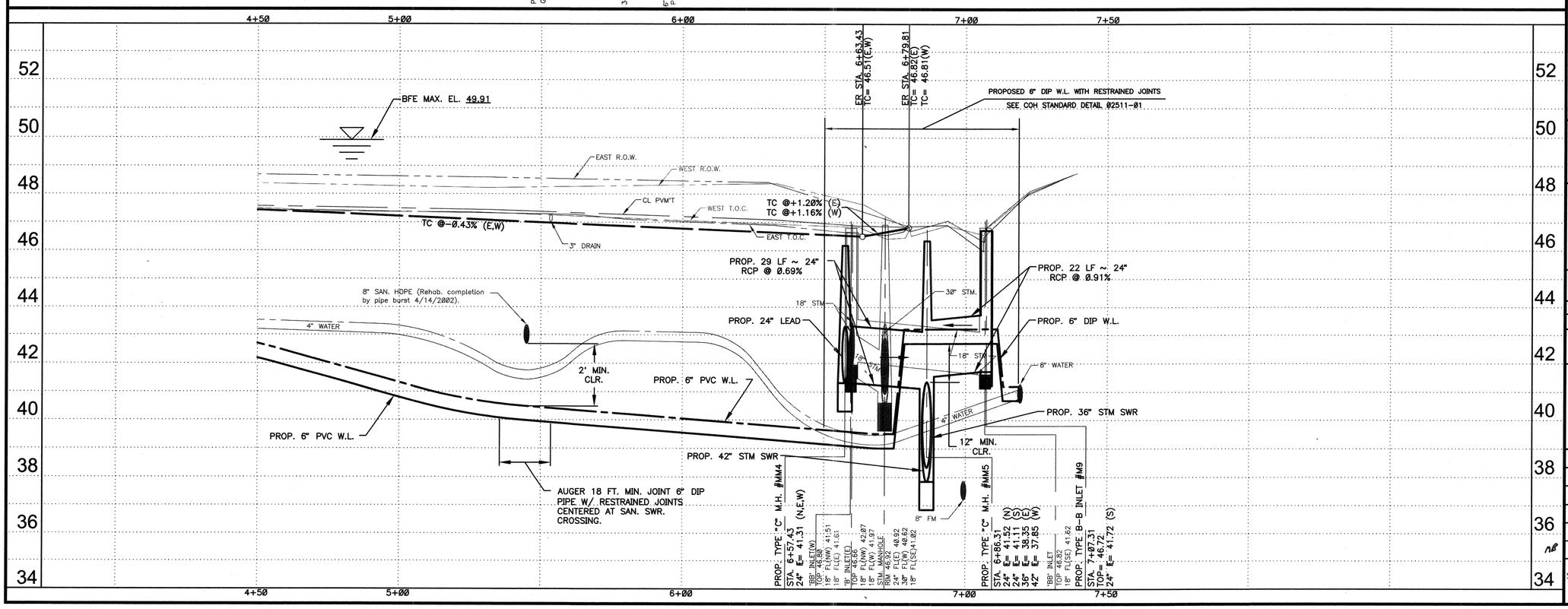
DRAWING SCALE
VERT: 1"=2' HORZ: 1"=20'

CITY OF HOUSTON PM
MARK BOARD, P.E.

SHEET No: 41 OF 122

FOR CITY OF HOUSTON USE ONLY
PUBLIC WORKS AND ENGINEERING — ARCHIVED AND FILED — 48978 — NUMBER — TEXAS





TBM'S:

TBM 5: Set 3/8" IR with Cap located behind the curb at the southeast corner of Murworth Drive and Kapri Lane, Murworth Drive Sta. 12+82.12, 15.39' right, Elev. 46.72.

TBM 21: Set Concrete Nail w/Shiner located in the pavement at Kapri Lane Sta. 3+72.55, 9.86' left, Elev. 47.59.

NOTES:

1. SEE SHEET 4 FOR KEYED NOTE CALLOUTS
2. SEE SHEETS 5,6, &7 FOR HORIZONTAL CONTROLS
3. FOR EXISTING UNDERGROUND UTILITIES NOTES (SEE SHEET 3)
4. ALL PAVING OFFSETS ARE SYMMETRICAL ABOUT THE BASELINE UNLESS OTHERWISE NOTED.
5. SEE SHEET 121 FOR DRIVEWAY TABLE
6. ALL ELEVATIONS SHOWN IN HOUSTORM CALCULATIONS ARE IN TSARP DATUM (1988 DATUM, 2001 ADJ.). SURVEY AND PLAN ELEVATIONS ARE IN NSRS (CORS) DATUM; EQUATION TO TIE FROM NSRS (CORS) DATUM TO TSARP DATUM IS:
TSARP EL. (ft) = NSRS EL. (ft) - 0.21

* SEE DRIVEWAY TABLE (SHEET 121)
** SEE NOTE ON DRIVEWAY TABLE (SHEET 121)

CURVE DATA

C3
Δ = 30°29'23"
R = 1009.64'
Arc Length = 537.27'
Chord Bearing = N12°49'23"E
Chord Length = 530.96'
T = 275.16'
E = 36.82'

STANDARD PROFILE LEGEND

CENTER LINE OF R.O.W.
PROPERTY LINE N & E
PROPERTY LINE S & W
DITCH OR TOP OF CURB N&E
DITCH OR TOP OF CURB S&W

MK.	DESCRIPTION	DATE	DWN.	CHK.

REVISIONS

PRIVATE UTILITY LINES SHOWN
AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.

Centerpoint Energy Power Facilities — Date: 11/3/11
(Approved only for crossing underground ductlines, unless otherwise noted.)
Valid At Time Of Review Only

Approved for AT&T Texas/SWBT underground conduit facilities only. — Date: 11-1-11
Signature valid for one year.

Centerpoint Energy Gas Facilities — Date: 11/3/11
(Centerpoint service lines are not shown.)

Cable Company — Date:

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HDR Engineering Inc. Texas Reg. No. F-754

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Fax (713) 622-9265

STATE OF TEXAS — JOHN D. RUDLOFF — 83386 — LICENSED PROFESSIONAL ENGINEER — 10/9/11

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 — Dwn By: P. Hopkins
Date: May 2011 — Chkd By: D. Jorgensen

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Kapri Lane
Sta. 4+50 to End

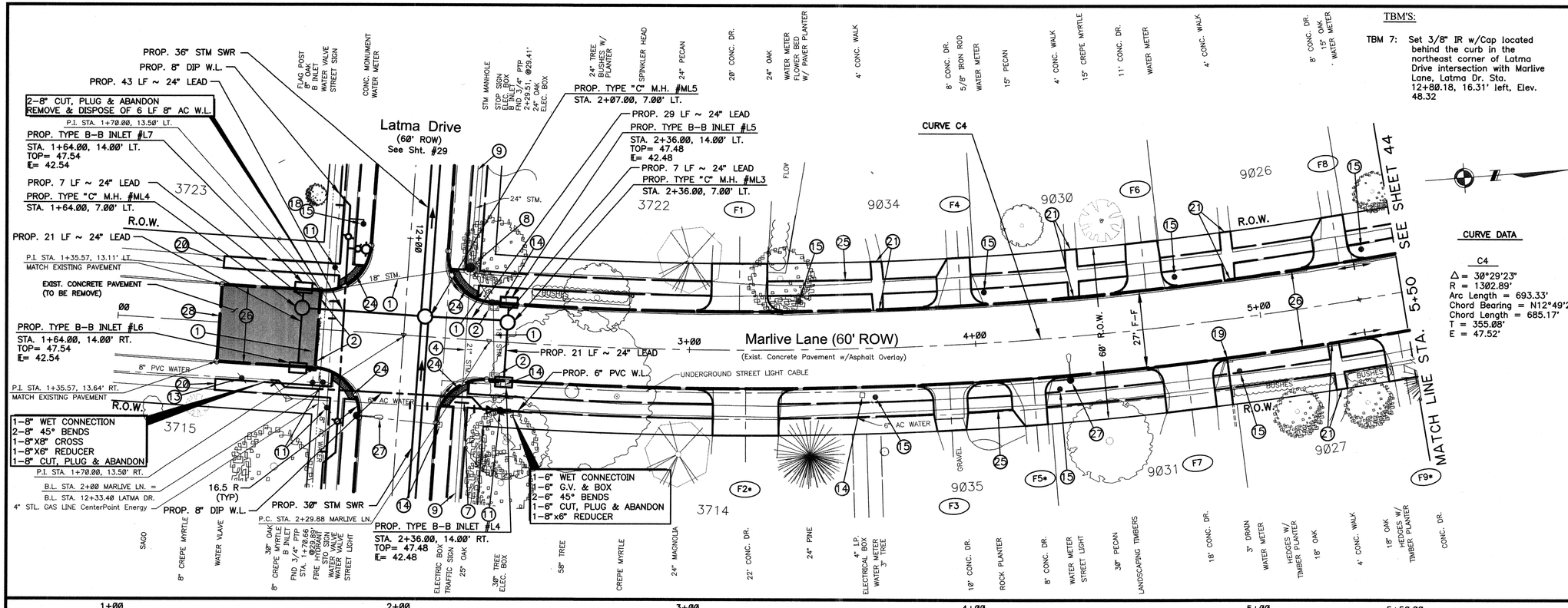
WBS NO.
N-000378-0002-4

DRAWING SCALE
VERT: 1"=2' HORZ: 1"=20'

CITY OF HOUSTON PM
MARK BOARD, P.E.

SHEET No: 42 OF 122

FOR CITY OF HOUSTON USE ONLY
PUBLIC WORKS AND ENGINEERING — APPROVED — 48978 — JOB NUMBER — TEXAS



TBM'S:

TBM 7: Set 3/8" IR w/Cap located behind the curb in the northeast corner of Latma Drive intersection with Marlive Lane, Latma Dr. Sta. 12+80.18, 16.31' left, Elev. 48.32

NOTES:

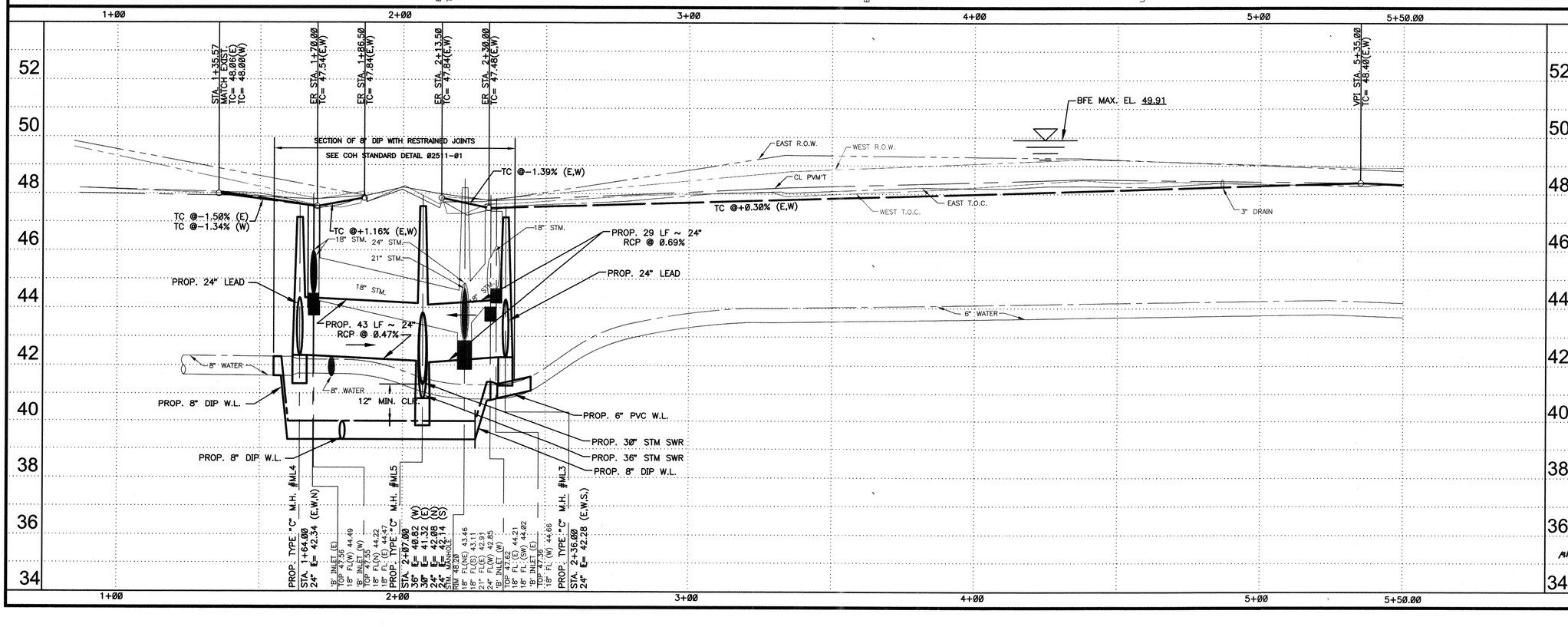
1. SEE SHEET 4 FOR KEYED NOTE CALLOUTS
2. SEE SHEETS 5,6, &7 FOR HORIZONTAL CONTROLS
3. FOR EXISTING UNDERGROUND UTILITIES NOTES (SEE SHEET 3)
4. ALL PAVING OFFSETS ARE SYMMETRICAL ABOUT THE BASELINE UNLESS OTHERWISE NOTED.
5. SEE SHEET 121 FOR DRIVEWAY TABLE
6. ALL ELEVATIONS SHOWN IN HOUSTORM CALCULATIONS ARE IN TSARP DATUM (1988 DATUM, 2001 ADJ.). SURVEY AND PLAN ELEVATIONS ARE IN NSRS (CORS) DATUM; EQUATION TO TIE FROM NSRS (CORS) DATUM TO TSARP DATUM IS: TSARP EL. (ft) = NSRS EL. (ft) - 0.21

CURVE DATA

C4
Δ = 39°29'23"
R = 1302.89'
Arc Length = 693.33'
Chord Bearing = N12°49'23"E
Chord Length = 685.17'
T = 355.08'
E = 47.52'

PROP. CONCRETE TRANSITION (SEE DETAIL SHEET 118)

* SEE DRIVEWAY TABLE (SHEET 121)
** SEE NOTE ON DRIVEWAY TABLE (SHEET 121)



STANDARD PROFILE LEGEND

CENTER LINE OF R.O.W. ——————
PROPERTY LINE N & E ——— — ———
PROPERTY LINE S & W ——— — ———
DITCH OR TOP OF CURB N&E ——— — ———
DITCH OR TOP OF CURB S&W ——————

MK.	DESCRIPTION	DATE	DWN.	CHK.

REVISIONS

PRIVATE UTILITY LINES SHOWN
AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.

Centerpoint Energy Power Facilities — Date: 11/3/11
(Approved only for crossing underground ductlines, unless otherwise noted.) Valid At Time Of Review Only

Approved for AT&T Texas/SWBT underground conduit facilities only. Signature valid for one year. — Date: 11-1-11

Centerpoint Energy Gas Facilities — Date: 11/3/11
(Centerpoint service lines are not shown.)

Cable Company — Date:

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Fax (713) 622-9265

STATE OF TEXAS — JOHN D. RUDLOFF — 83386 — LICENSED PROFESSIONAL ENGINEER — 10/19/11

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051	Dwn By: P. Hopkins
Date: May 2011	Chkd By: D. Jorgensen

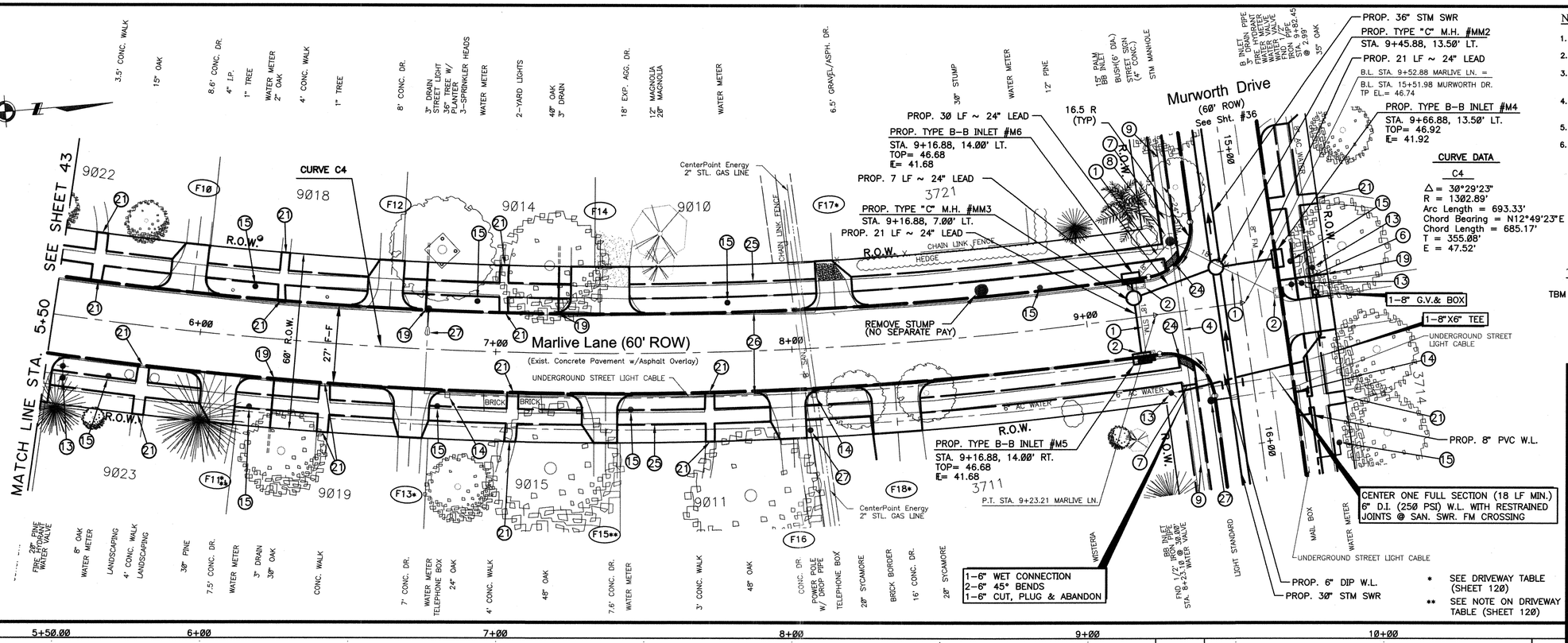
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Marlive Lane
Sta. 1+00 to Sta. 5+50

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	
DRAWING SCALE	
VERT: 1"=2' HORZ: 1"=20'	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	
SHEET No: 43 OF 122	

PUBLIC WORKS AND ENGINEERING — PLANS FILED — 48978 — NUMBER — TEXAS



NOTES:

1. SEE SHEET 4 FOR KEYED NOTE CALLOUTS
2. SEE SHEETS 5,6, &7 FOR HORIZONTAL CONTROLS
3. FOR EXISTING UNDERGROUND UTILITIES NOTES (SEE SHEET 3)
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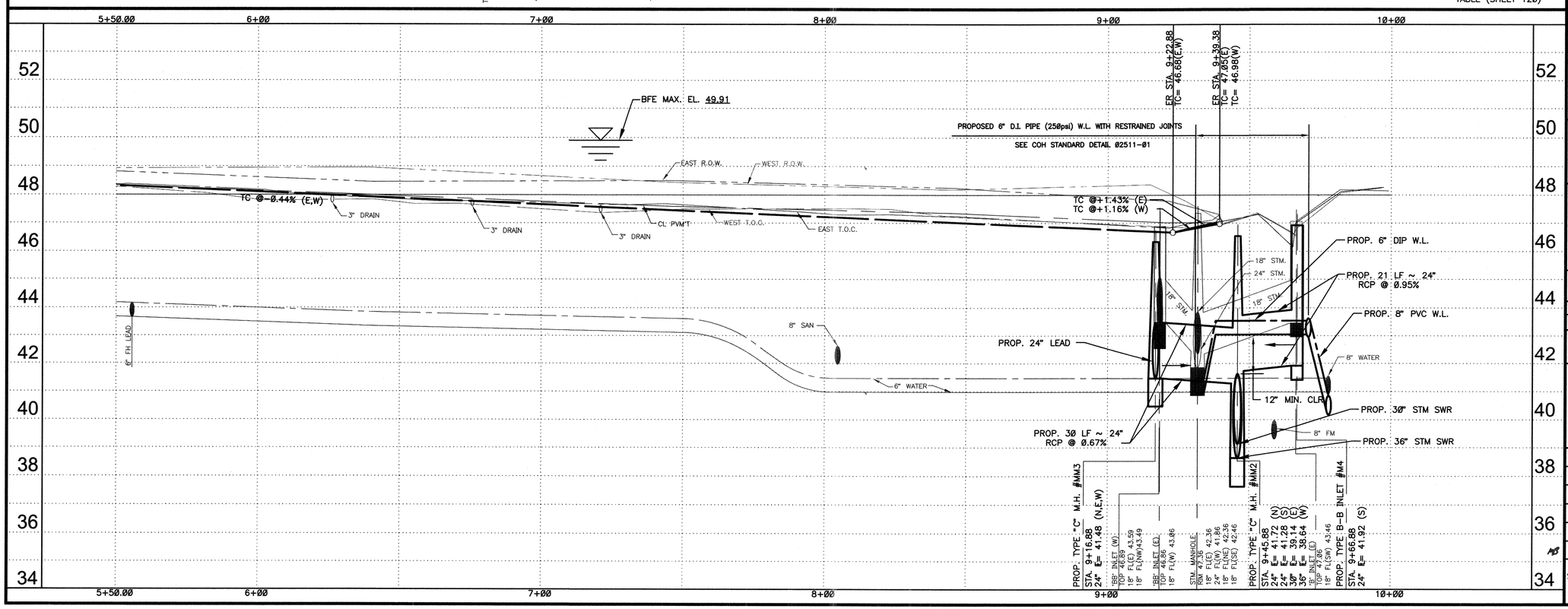
CURVE DATA

C4
Δ = 30°29'23"
R = 1302.89'
Arc Length = 693.33'
Chord Bearing = N12°49'23"E
Chord Length = 685.17'
T = 355.08'
E = 47.52'

TBM'S:

TBM 11: Cut X in concrete sidewalk located at the southeast corner of Murworth Drive and Marlive Lane, Murworth Dr. Sta. 15+70.92, 21.60' right, elev. 47.16.



STANDARD PROFILE LEGEND

CENTER LINE OF R.O.W.
PROPERTY LINE N & E
PROPERTY LINE S & W
DITCH OR TOP OF CURB N&E
DITCH OR TOP OF CURB S&W

MK.	DESCRIPTION	DATE	DWN.	CHK.

REVISIONS

PRIVATE UTILITY LINES SHOWN
AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.

Centerpoint Energy Power Facilities — Date: 11/3/11
(Approved only for crossing underground ductlines, unless otherwise noted.)
Valid At Time Of Review Only

Approved for AT&T Texas/SWBT underground conduit facilities only. — Date: 11-1-11
Signature valid for one year.

Centerpoint Energy Gas Facilities — Date: 11/3/11
(Centerpoint service lines are not shown.)

Cable Company — Date:

HDR | CLAUNCH & MILLER
Engineering Consultants
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JOHN D. RUDLOFF
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Suite 1000
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(713) 622-9264
Fax (713) 622-9265

STATE OF TEXAS — JOHN D. RUDLOFF — 83386 — LICENSED PROFESSIONAL ENGINEER — 10/19/11

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 — Dwn By: P. Hopkins
Date: May 2011 — Chkd By: D. Jorgensen

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Marlive Lane
Sta. 5+50 to End

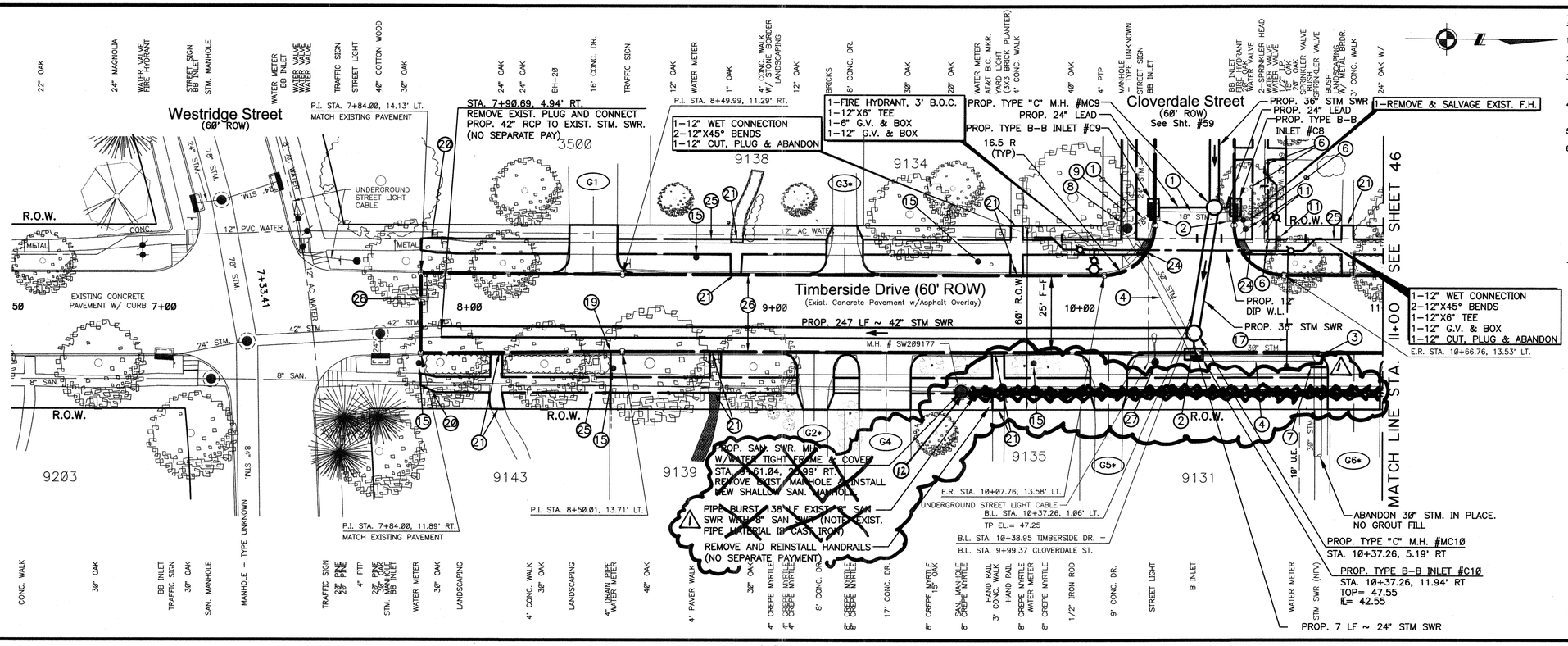
WBS NO.
N-000378-0002-4

DRAWING SCALE
VERT: 1"=2' HORZ: 1"=20'

CITY OF HOUSTON PM
MARK BOARD, P.E.

SHEET No: 44 OF 122

FOR CITY OF HOUSTON USE ONLY
PUBLIC WORKS AND ENGINEERING — REVIEWED AND FILED — 48978 — NUMBER



NOTES:

1. SEE SHEET 4 FOR KEYED NOTE CALLOUTS
2. SEE SHEETS 5,6, &7 FOR HORIZONTAL CONTROLS
3. FOR EXISTING UNDERGROUND UTILITIES NOTES (SEE SHEET 3)
4. ALL PAVING OFFSETS ARE SYMMETRICAL ABOUT THE BASELINE UNLESS OTHERWISE NOTED.
5. SEE SHEET 121 FOR DRIVEWAY TABLE
6. ALL ELEVATIONS SHOWN IN HOUSTORM CALCULATIONS ARE IN TSARP DATUM (1988 DATUM, 2001 ADJ.). SURVEY AND PLAN ELEVATIONS ARE IN NSRS (CORS) DATUM; EQUATION TO TIE FROM NSRS (CORS) DATUM TO TSARP DATUM IS: TSARP EL. (ft) = NSRS EL. (ft) – 0.21

TBM'S:

TBM 15: Set 3/8" IR w/Cap located behind the curb at on the east side of Timberside Drive at the Cloverdale Street intersection, Timberside Dr. Sta. 10+47.19, 15.59' right, elev. 48.15.

* SEE DRIVEWAY TABLE (SHEET 121)

STANDARD PROFILE LEGEND

CENTER LINE OF R.O.W. ——————
PROPERTY LINE N & E ——— — ———
PROPERTY LINE S & W — — — — —
DITCH OR TOP OF CURB N&E ——— — ———
DITCH OR TOP OF CURB S&W ——————

MK.	DESCRIPTION	DATE	DWN.	CHK.
1	REVISED SAN. SWR.	12-22-11	AS	HW

REVISIONS

PRIVATE UTILITY LINES SHOWN
AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.

Centerpoint Energy Power Facilities — Date: 11/3/11
(Approved only for crossing underground ductlines, unless otherwise noted.)
Valid At Time Of Review Only

Date: 11-1-11
Approved for AT&T Texas/SWBT underground conduit facilities only.
Signature valid for one year.

Centerpoint Energy Gas Facilities — Date: 11/7/11
(Centerpoint service lines are not shown.)

Cable Company — Date:

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(713) 622-9264• Fax (713) 622-9265• www.hdrinc.com
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(713) 622-9264
Fax (713) 622-9265

STATE OF TEXAS — JOHN D. RUDLOFF — 83386 — LICENSED — PROFESSIONAL ENGINEER
10/19/11

SURVEYED BY: Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 — Dwn By: P. Hopkins
Date: May 2011 — Chkd By: D. Jorgensen

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Timberside Drive
Sta. 6+50 to Sta. 11+00

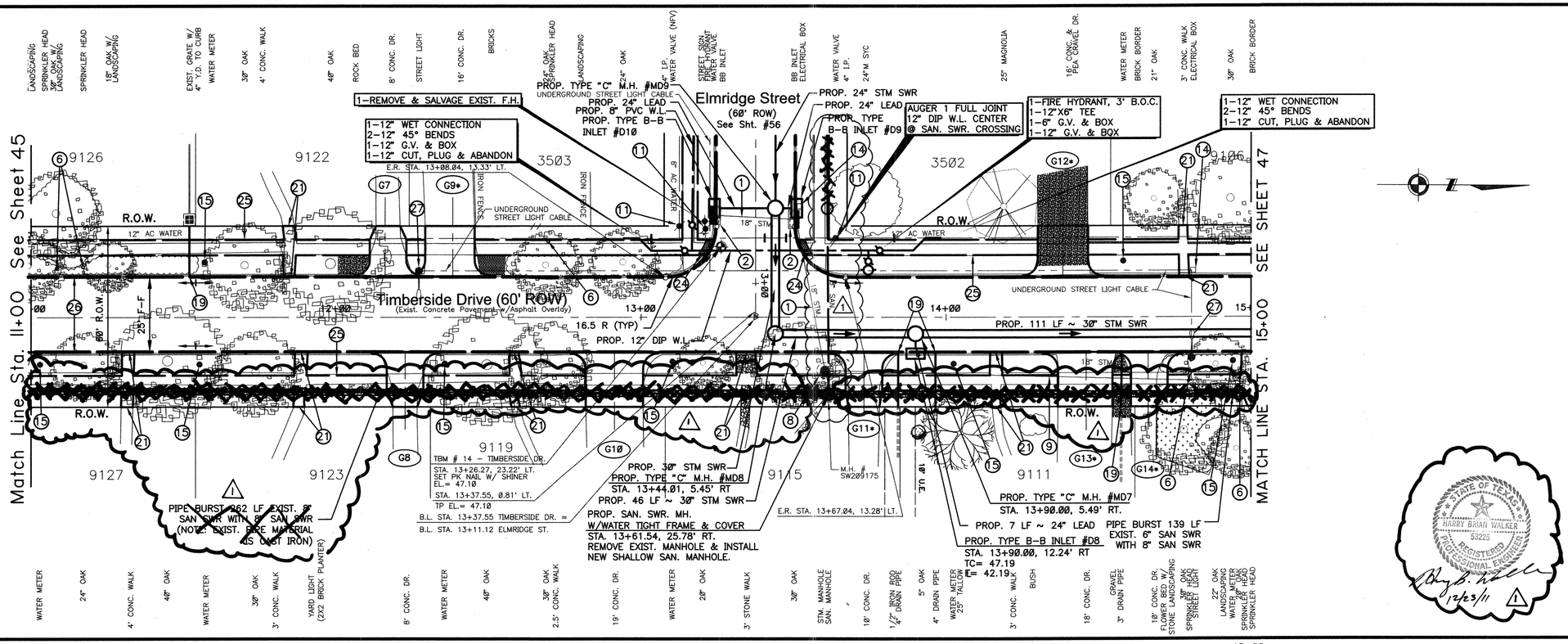
WBS NO.
N-000378-0002-4

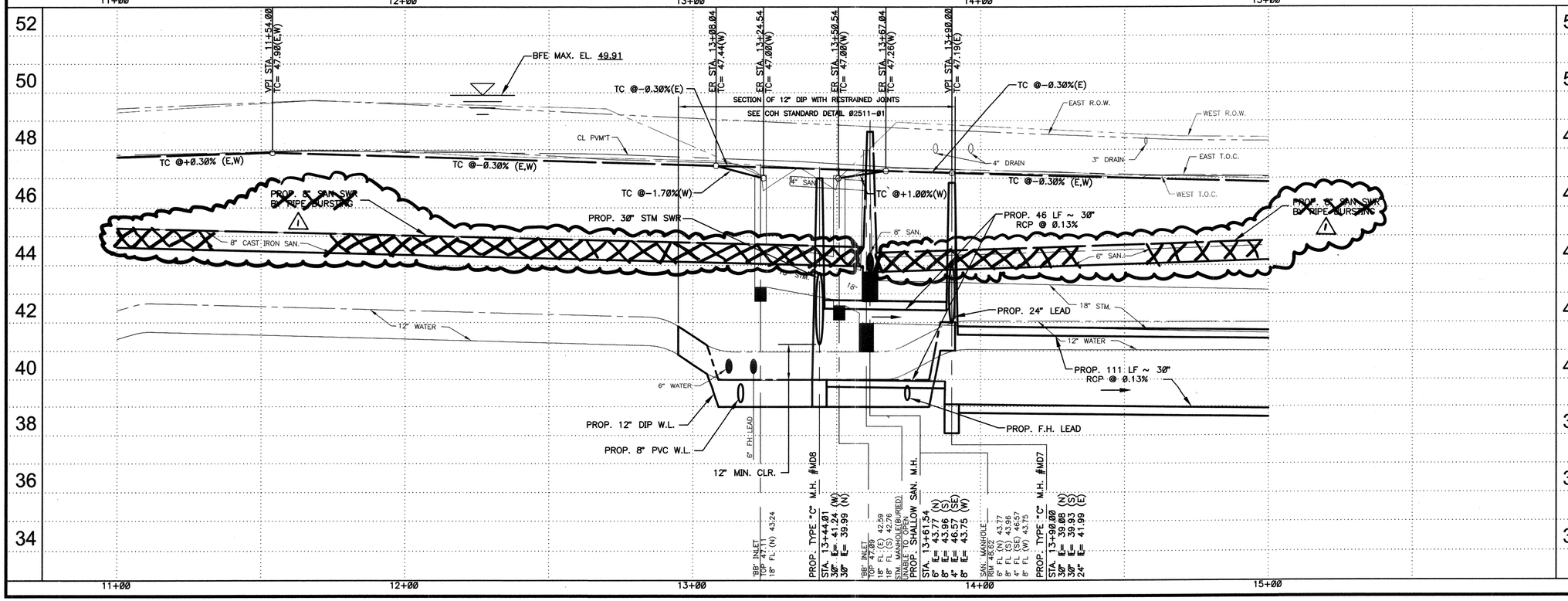
DRAWING SCALE
VERT: 1"=2' HORZ: 1"=20'

CITY OF HOUSTON PM
MARK BOARD, P.E.

SHEET No: 45 OF 122

FOR CITY OF HOUSTON USE ONLY
PUBLIC WORKS AND ENGINEERING — ENGINEERING FILE — 48978 — NUMBER — TEXAS





NOTES:

1. SEE SHEET 4 FOR KEYED NOTE CALLOUTS
2. SEE SHEETS 5,6, &7 FOR HORIZONTAL CONTROLS
3. FOR EXISTING UNDERGROUND UTILITIES NOTES (SEE SHEET 3)
4. ALL PAVING OFFSETS ARE SYMMETRICAL ABOUT THE BASELINE UNLESS OTHERWISE NOTED.
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TBM'S:

TBM 14: Set PK Nail w/Shiner located in the pavement within the southwest quadrant of the Elmridge Street and Timberside Drive intersection at Elmridge Street Sta. 12+87.90, 11.28' right, Elev. 47.19.

* SEE DRIVEWAY TABLE (SHEET 121)

STANDARD PROFILE LEGEND

CENTER LINE OF R.O.W.
PROPERTY LINE N & E
PROPERTY LINE S & W
DITCH OR TOP OF CURB N&E
DITCH OR TOP OF CURB S&W

MK.	DESCRIPTION	DATE	DWN.	CHK.
1	REVISED SAN. SWR.	12/22	AS	HW

REVISIONS

PRIVATE UTILITY LINES SHOWN
AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.

Centerpoint Energy Power Facilities
(Approved only for crossing underground ductlines, unless otherwise noted.)
Valid At Time Of Review Only
Date:

Date: 12-6-11
Approval for AT&T Texas/SWBT underground conduit facilities only. Signature valid for one year.

Centerpoint Energy Gas Facilities
(Centerpoint service lines are not shown.)
Date:

Cable Company

STATE OF TEXAS
HARRY BRIAN WALKER
53225
REGISTERED
PROFESSIONAL ENGINEER
12/23/11

HDR | CLAUNCH & MILLER
Engineering Consultants
4635 Southwest Freeway, Suite 1000 • Houston, Texas 77027
(713) 622-9264 • Fax (713) 622-9265 • www.hdrinc.com
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STATE OF TEXAS
HARRY BRIAN WALKER
53225
REGISTERED
PROFESSIONAL ENGINEER

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 | Dwn By: P. Hopkins
Date: May 2011 | Chkd By: D. Jorgensen

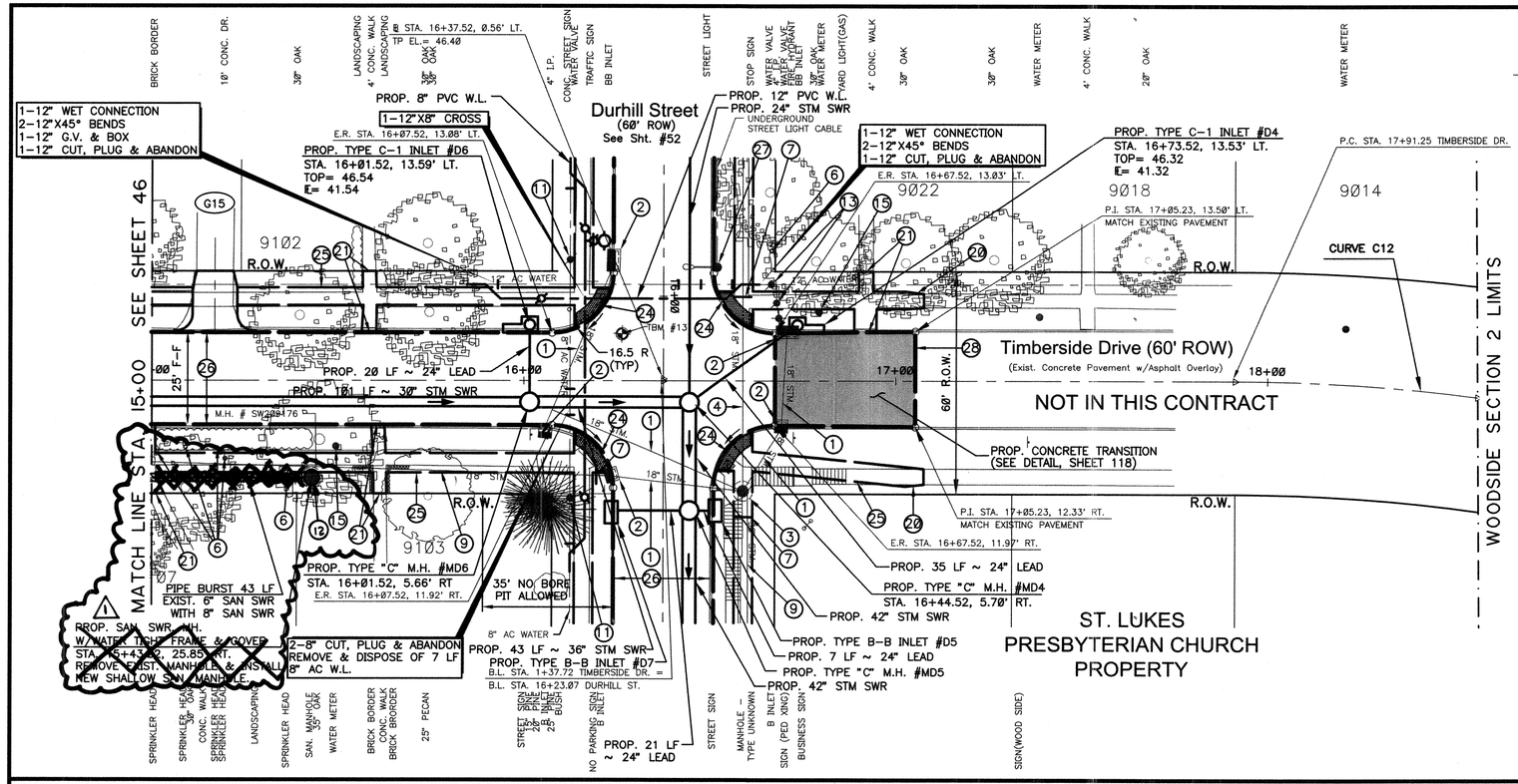
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

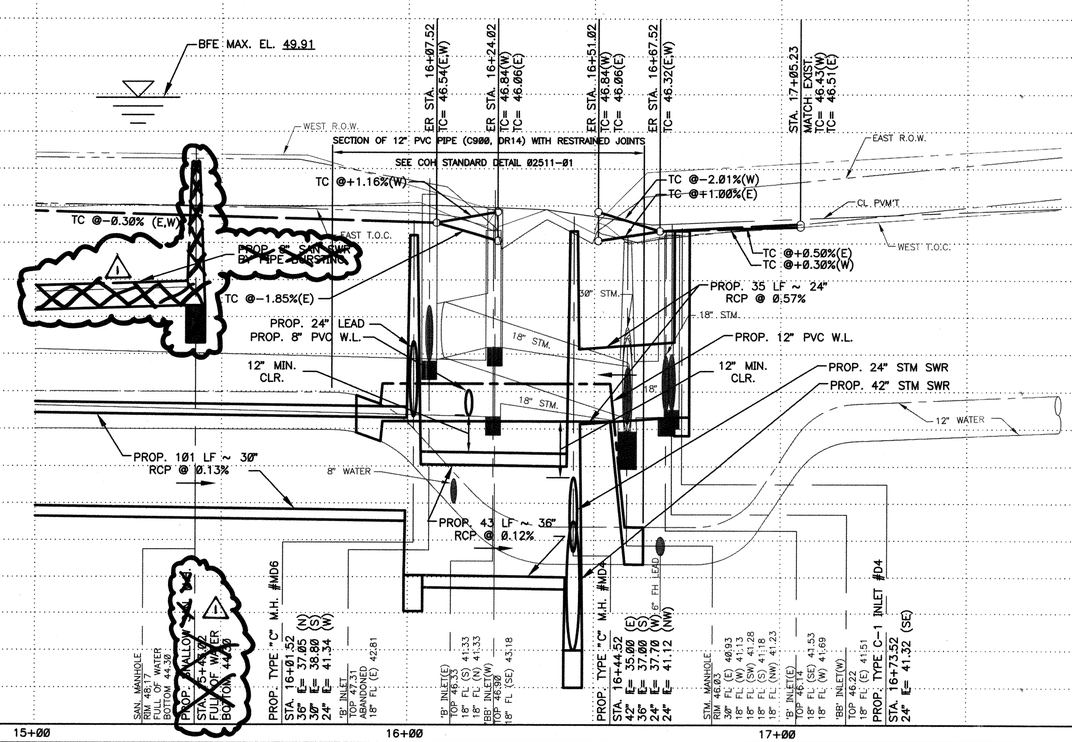
City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Timberside Drive
Sta. 11+00 to Sta. 15+00

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	PUBLIC WORKS AND ENGINEERING — ANTI FILED — 48978 — NUMBER — TEXAS
DRAWING SCALE	
VERT: 1"=2' HORZ: 1"=20'	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	

SHEET No: 46 OF 122





NOTES:

1. SEE SHEET 4 FOR KEYED NOTE CALLOUTS
2. SEE SHEETS 5,6, &7 FOR HORIZONTAL CONTROLS
3. FOR EXISTING UNDERGROUND UTILITIES NOTES (SEE SHEET 3)
4. ALL PAVING OFFSETS ARE SYMMETRICAL ABOUT THE BASELINE UNLESS OTHERWISE NOTED.
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   TSARP EL. (ft) = NSRS EL. (ft) – 0.21

TBM'S:

TBM 13: Set PK Nail w/Shiner located in the pavement within the southwest quadrant of the Durhill Street and Timberside Drive intersection at Durhill Street Sta. 16+10.25, 11.17' right, Elev. 46.88.

PROP. CONCRETE TRANSITION (SEE DETAIL SHEET 118)

STATE OF TEXAS
HARRY BRIAN WALKER
53225
REGISTERED
PROFESSIONAL ENGINEER
10/23/11

CURVE DATA

C12
Δ = 07°29'40"
R = 500.00'
Arc Length = 65.40'
Chord Bearing = S01°19'31"W
Chord Length = 65.35'
T = 32.75'
E = 1.07'

STANDARD PROFILE LEGEND

CENTER LINE OF R.O.W.
PROPERTY LINE N & E
PROPERTY LINE S & W
DITCH OR TOP OF CURB N&E
DITCH OR TOP OF CURB S&W

MK.	DESCRIPTION	DATE	DWN.	CHK.
1	REVISED SAN. SWR.	12/23/11	AS	HW

REVISIONS

PRIVATE UTILITY LINES SHOWN
AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.

Centerpoint Energy Power Facilities Date: 11/2/11
(Approved only for crossing underground ductlines, unless otherwise noted.)
Valid At Time Of Review Only

Approved for AT&T Texas/SWBT underground conduit facilities only. Date: 11-1-11
Signature valid for one year.

Centerpoint Energy Gas Facilities Date: 11/3/11
(Centerpoint service lines are not shown.)

Cable Company Date:

HDR | CLAUNCH & MILLER
Engineering Consultants
4635 Southwest Freeway, Suite 1000• Houston, Texas 77027
(713) 622-9264• Fax (713) 622-9265• www.hdrinc.com
HDR Engineering Inc. Texas Reg. No. F-754

JOHN D. RUDLOFF
4635 Southwest Freeway
Suite 1000
Houston, Texas 77027
(713) 622-9264
Fax (713) 622-9265

STATE OF TEXAS
JOHN D. RUDLOFF
83386
LICENSED
PROFESSIONAL ENGINEER
10/19/11

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 Dwn By: P. Hopkins
Date: May 2011 Chkd By: D. Jorgensen

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Timberside Drive
Sta. 15+00 to End

WBS NO.
N-000378-0002-4

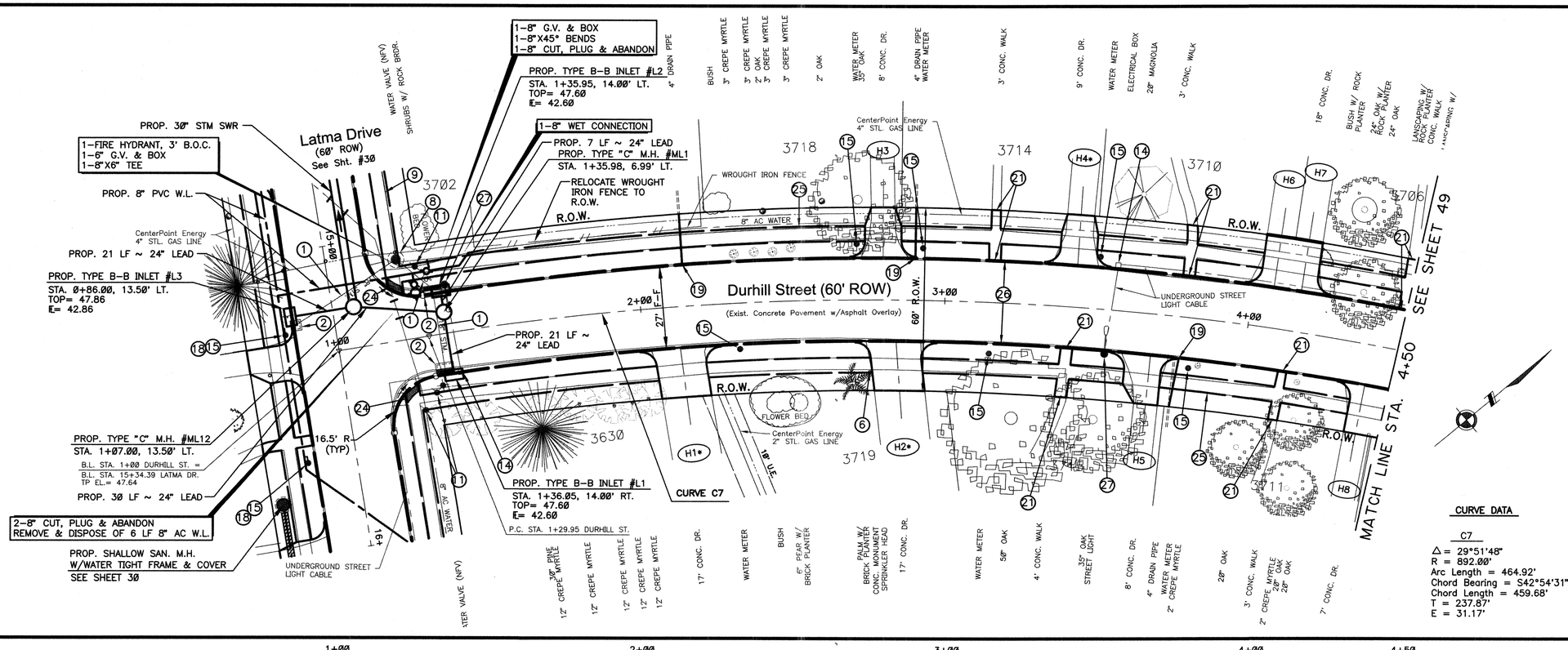
DRAWING SCALE
VERT: 1"=2' HORZ: 1"=20'

CITY OF HOUSTON PM
MARK BOARD, P.E.

SHEET No: 47 OF 122

FOR CITY OF HOUSTON USE ONLY

PUBLIC WORKS AND ENGINEERING
REVIEWED AND FILED
48978
NUMBER
TEXAS



CURVE DATA

C7
Δ = 29°51'48"
R = 892.00'
Arc Length = 464.92'
Chord Bearing = S42°54'31"W
Chord Length = 459.68'
T = 237.87'
E = 31.17'

NOTES:

1. SEE SHEET 4 FOR KEYED NOTE CALLOUTS
2. SEE SHEETS 5,6, &7 FOR HORIZONTAL CONTROLS
3. FOR EXISTING UNDERGROUND UTILITIES NOTES (SEE SHEET 3)
4. ALL PAVING OFFSETS ARE SYMMETRICAL ABOUT THE BASELINE UNLESS OTHERWISE NOTED.
5. SEE SHEET 121 FOR DRIVEWAY TABLE
6. ALL ELEVATIONS SHOWN IN HOUSTORM CALCULATIONS ARE IN TSARP DATUM (1988 DATUM, 2001 ADJ.). SURVEY AND PLAN ELEVATIONS ARE IN NSRS (CORS) DATUM; EQUATION TO TIE FROM NSRS (CORS) DATUM TO TSARP DATUM IS:
TSARP EL. (ft) = NSRS EL. (ft) – 0.21

TBM'S:

TBM 8: Set PK Nail w/Shiner located in the pavement in the northwest quadrant of the Latma Drive intersection with Durhill Street at Latma Dr. Sta. 15+16.49, 12.32' left, Elev. 47.82

* SEE DRIVEWAY TABLE (SHEET 121)

STANDARD PROFILE LEGEND

CENTER LINE OF R.O.W.
PROPERTY LINE N & E
PROPERTY LINE S & W
DITCH OR TOP OF CURB N&E
DITCH OR TOP OF CURB S&W

MK.	DESCRIPTION	DATE	DWN.	CHK.

REVISIONS

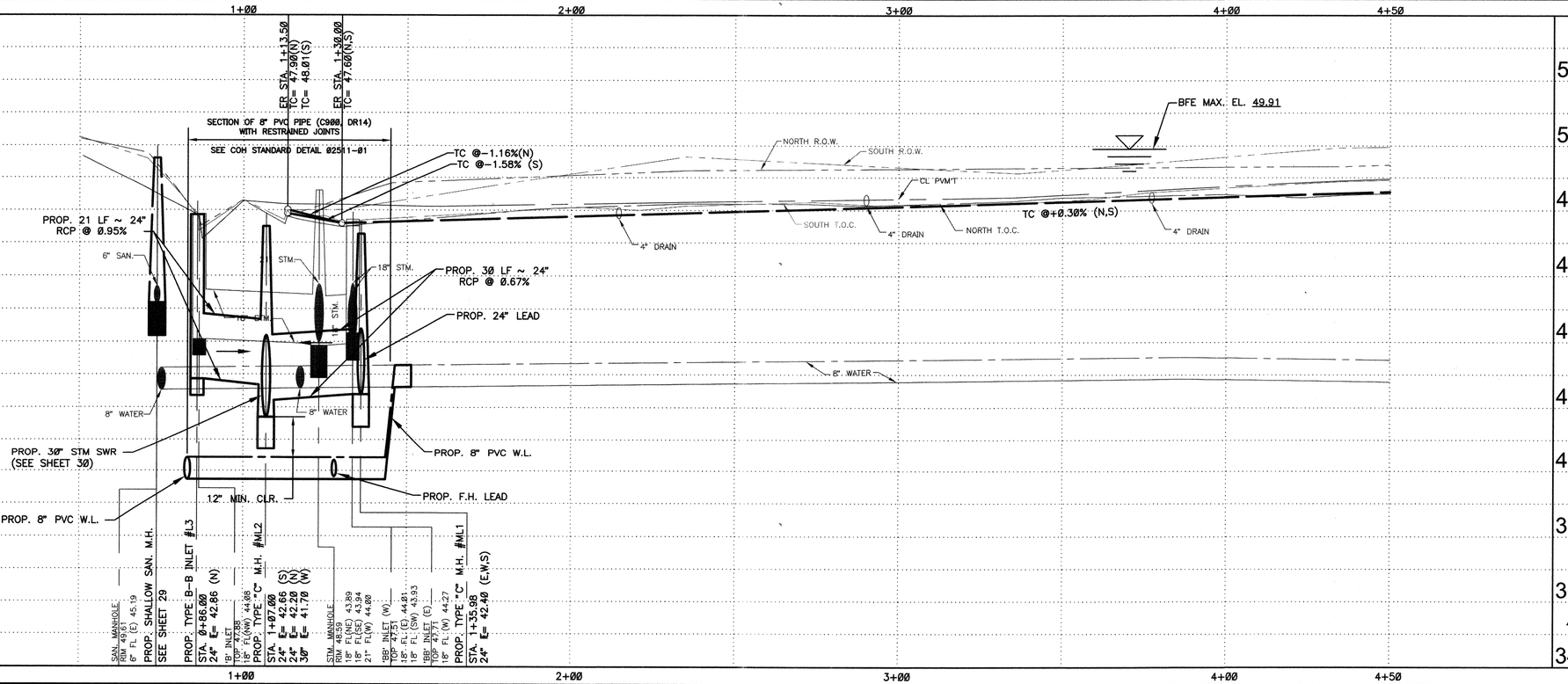
PRIVATE UTILITY LINES SHOWN
AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.

Centerpoint Energy Power Facilities Date: 11/2/11
(Approved only for crossing underground ductlines, unless otherwise noted.)
Valid At Time Of Review Only

Date: 11-1-11
Approved for AT&T Texas/SWBT underground conduit facilities only.
Signature valid for one year.

Centerpoint Energy Gas Facilities Date: 11/3/11
(Centerpoint service lines are not shown.)

Cable Company Date:



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LICENSED
PROFESSIONAL ENGINEER
10/19/11

Job No.: 09-051 Dwn By: P. Hopkins
Date: May 2011 Chkd By: D. Jorgensen

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

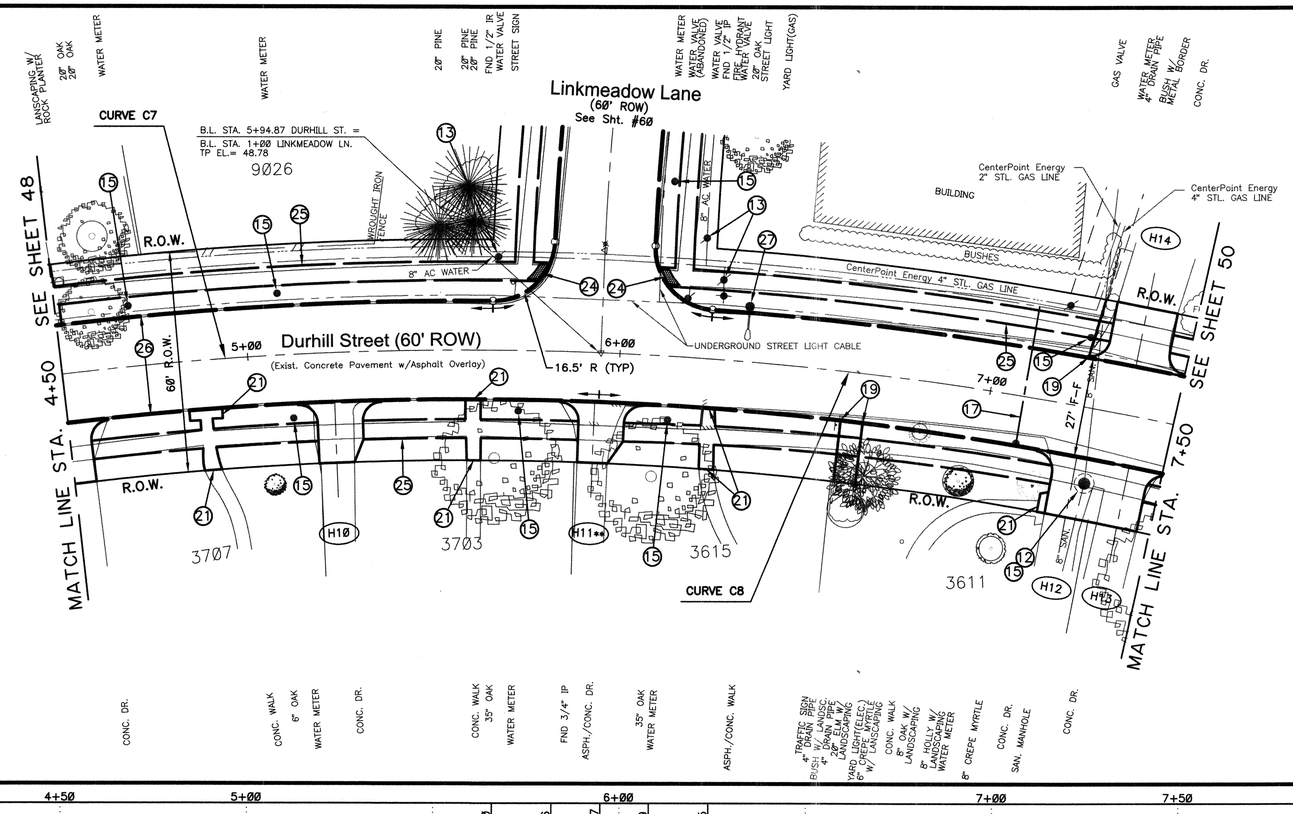
City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

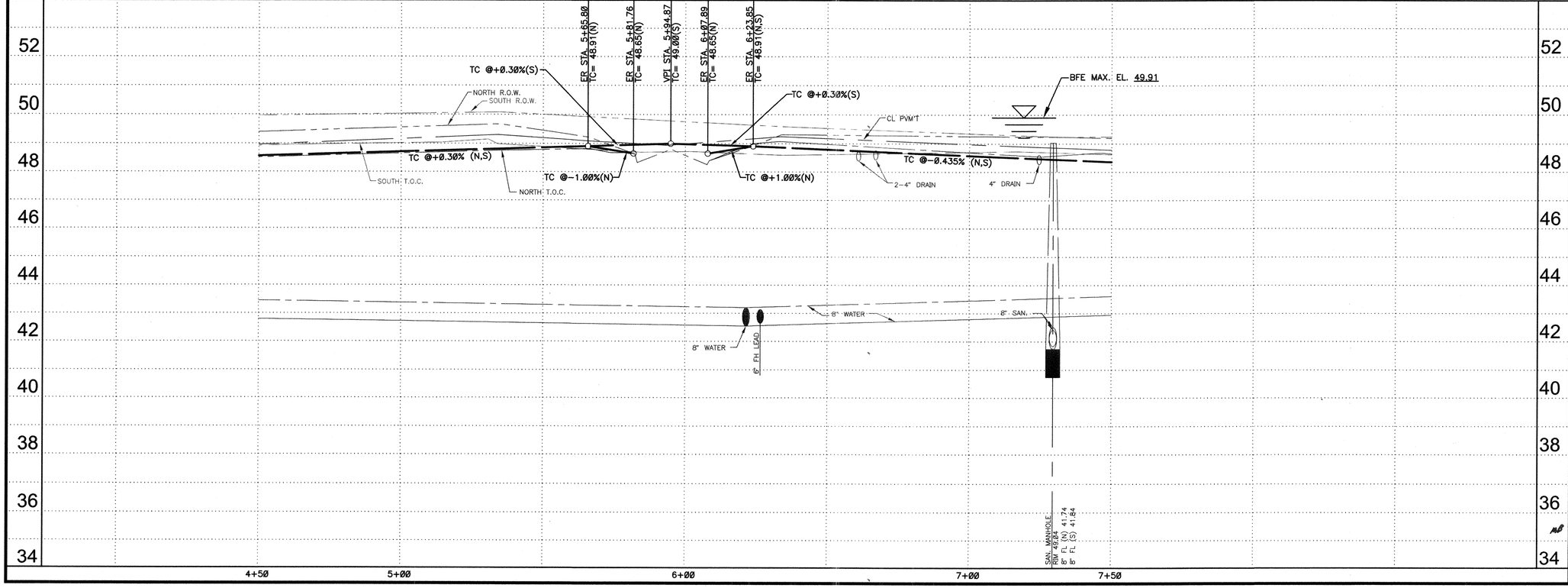
Durhill Street
Sta. 1+00 to Sta. 4+50

WBS NO.
N-000378-0002-4
DRAWING SCALE
VERT: 1"=2' HORZ: 1"=20'
CITY OF HOUSTON PM
MARK BOARD, P.E.

FOR CITY OF HOUSTON USE ONLY
PUBLIC WORKS AND ENGINEERING
FILED
48978
NUMBER

SHEET No: 48 OF 122





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TBM'S:

TBM 9: Set 3/8" IR w/Cap located behind the curb at Linkmeadow Lane Sta. 1+34.53, 16.74' right, Elev. 48.70.

** SEE NOTE ON DRIVEWAY TABLE (SHEET 121)

CURVE DATA

C8
Δ = 17°45'06"
R = 892.00'
Arc Length = 276.36'
Chord Bearing = S66°42'58"W
Chord Length = 275.26'
T = 139.30'
E = 10.81'

C7
Δ = 29°51'48"
R = 892.00'
Arc Length = 464.92'
Chord Bearing = S42°54'31"W
Chord Length = 459.68'
T = 237.87'
E = 31.17'

STANDARD PROFILE LEGEND

CENTER LINE OF R.O.W.
PROPERTY LINE N & E
PROPERTY LINE S & W
DITCH OR TOP OF CURB N&E
DITCH OR TOP OF CURB S&W

MK.	DESCRIPTION	DATE	DWN.	CHK.

REVISIONS

PRIVATE UTILITY LINES SHOWN
AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.

Centerpoint Energy Power Facilities
(Approved only for crossing underground ductlines, unless otherwise noted.)
Valid At Time Of Review Only
Date: 11/3/11

Approved for AT&T Texas/SWBT underground conduit facilities only.
Signature valid for one year.
Date: 11-1-11

Centerpoint Energy Gas Facilities
(Centerpoint service lines are not shown.)
Date: 11/3/11

Cable Company
Date:

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STATE OF TEXAS
JOHN D. RUDLOFF
83386
LICENSED
PROFESSIONAL ENGINEER
10/19/11

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 | Dwn By: P. Hopkins
Date: May 2011 | Chkd By: D. Jorgensen

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Durhill Street
Sta. 4+50 to Sta. 7+50

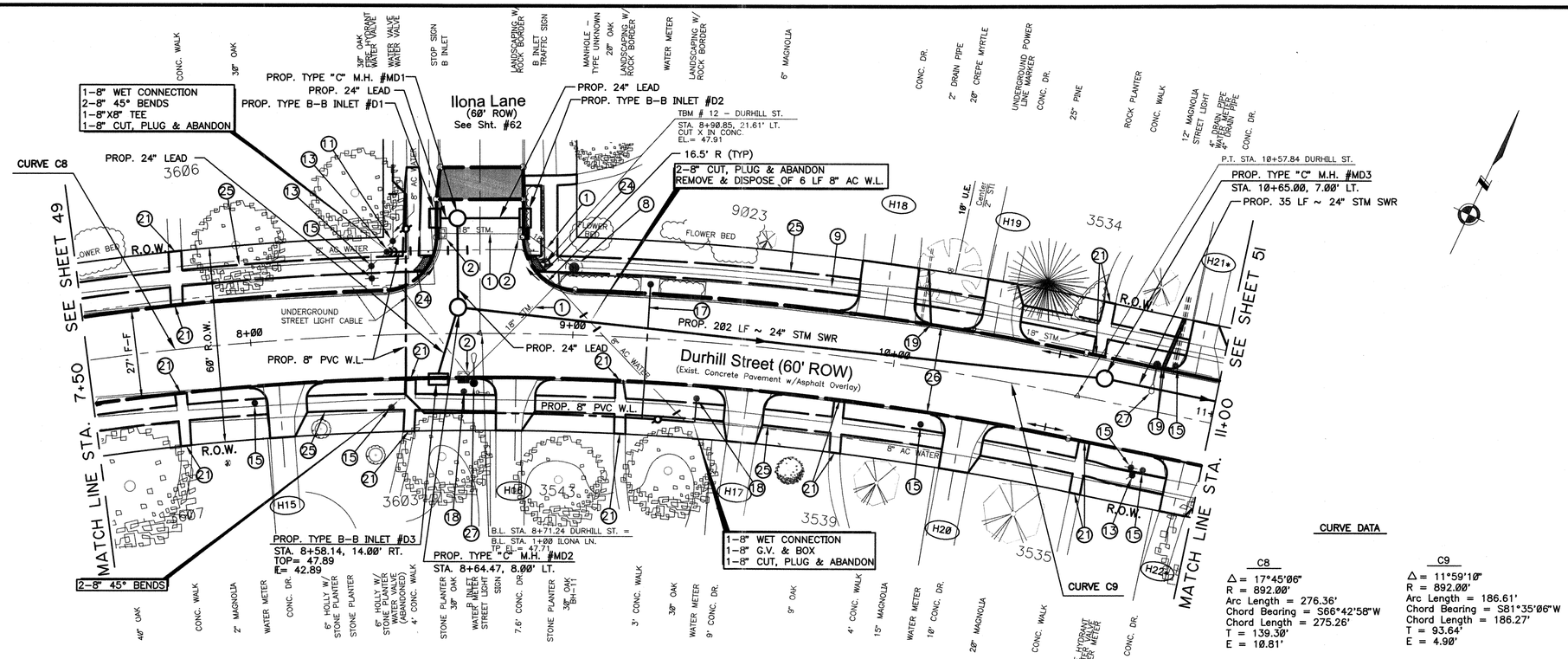
WBS NO.
N-000378-0002-4

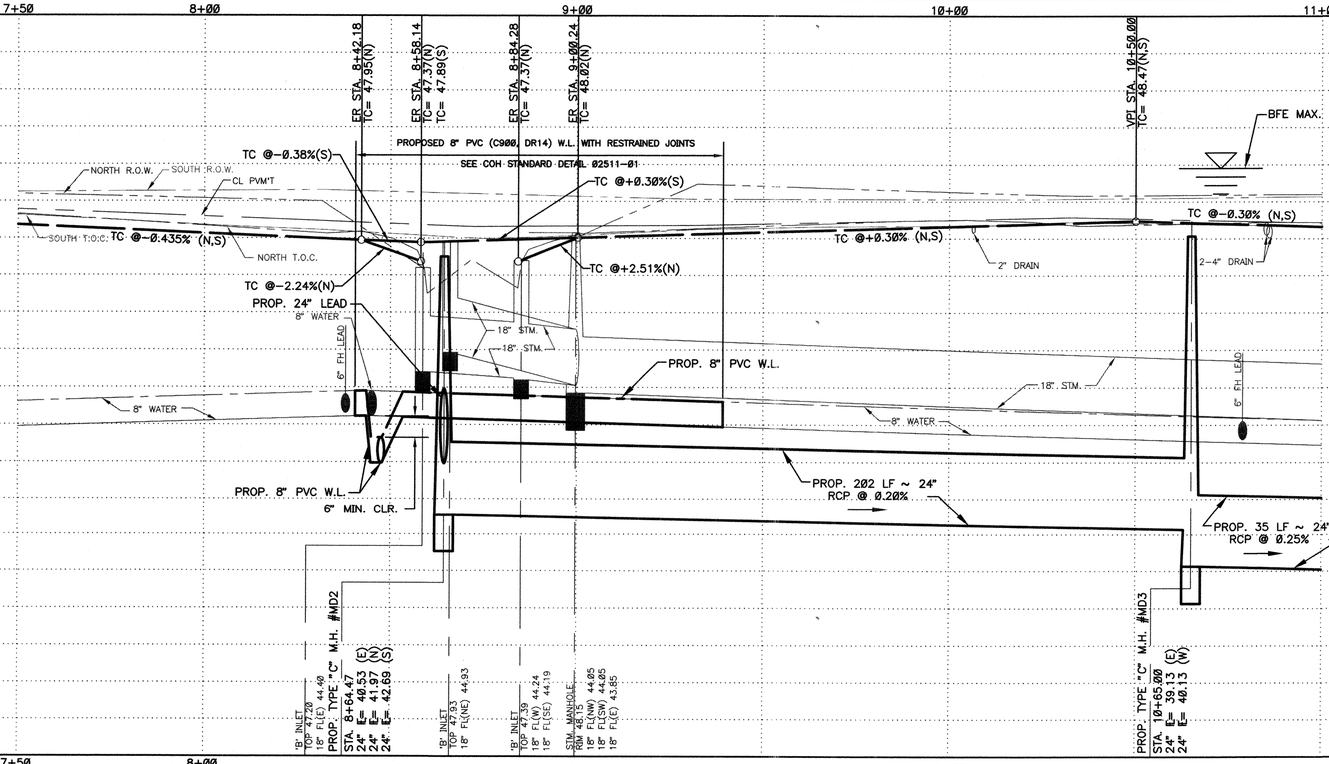
DRAWING SCALE
VERT: 1"=2' HORZ: 1"=20'

CITY OF HOUSTON PM
MARK BOARD, P.E.

SHEET No: 49 OF 122

FOR CITY OF HOUSTON USE ONLY
PUBLIC WORKS AND ENGINEERING
ARCHIVED FILED
48978
LICENSE NUMBER





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TSARP EL. (ft) = NSRS EL. (ft) - 0.21

TBM'S:

TBM 12: Cut X in concrete sidewalk located at the northwest corner of Durhill Street and Iona Lane at Durhill Street Sta. 8+90.85, 21.61' left, Elev. 47.91.

PROP. CONCRETE TRANSITION (SEE DETAIL SHEET 118)

* SEE DRIVEWAY TABLE (SHEET 121)

STANDARD PROFILE LEGEND

CENTER LINE OF R.O.W.
PROPERTY LINE N & E
PROPERTY LINE S & W
DITCH OR TOP OF CURB N&E
DITCH OR TOP OF CURB S&W

MK.	DESCRIPTION	DATE	DWN.	CHK.

REVISIONS

PRIVATE UTILITY LINES SHOWN
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Centerpoint Energy Power Facilities Date: 11/3/11
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Valid At Time Of Review Only

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Signature valid for one year.

Centerpoint Energy Gas Facilities Date: 11/3/11
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Cable Company Date:

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STATE OF TEXAS
JOHN D. RUDLOFF
83386
LICENSED
PROFESSIONAL ENGINEER
10/19/11

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 Dwn By: P. Hopkins
Date: May 2011 Chkd By: D. Jorgensen

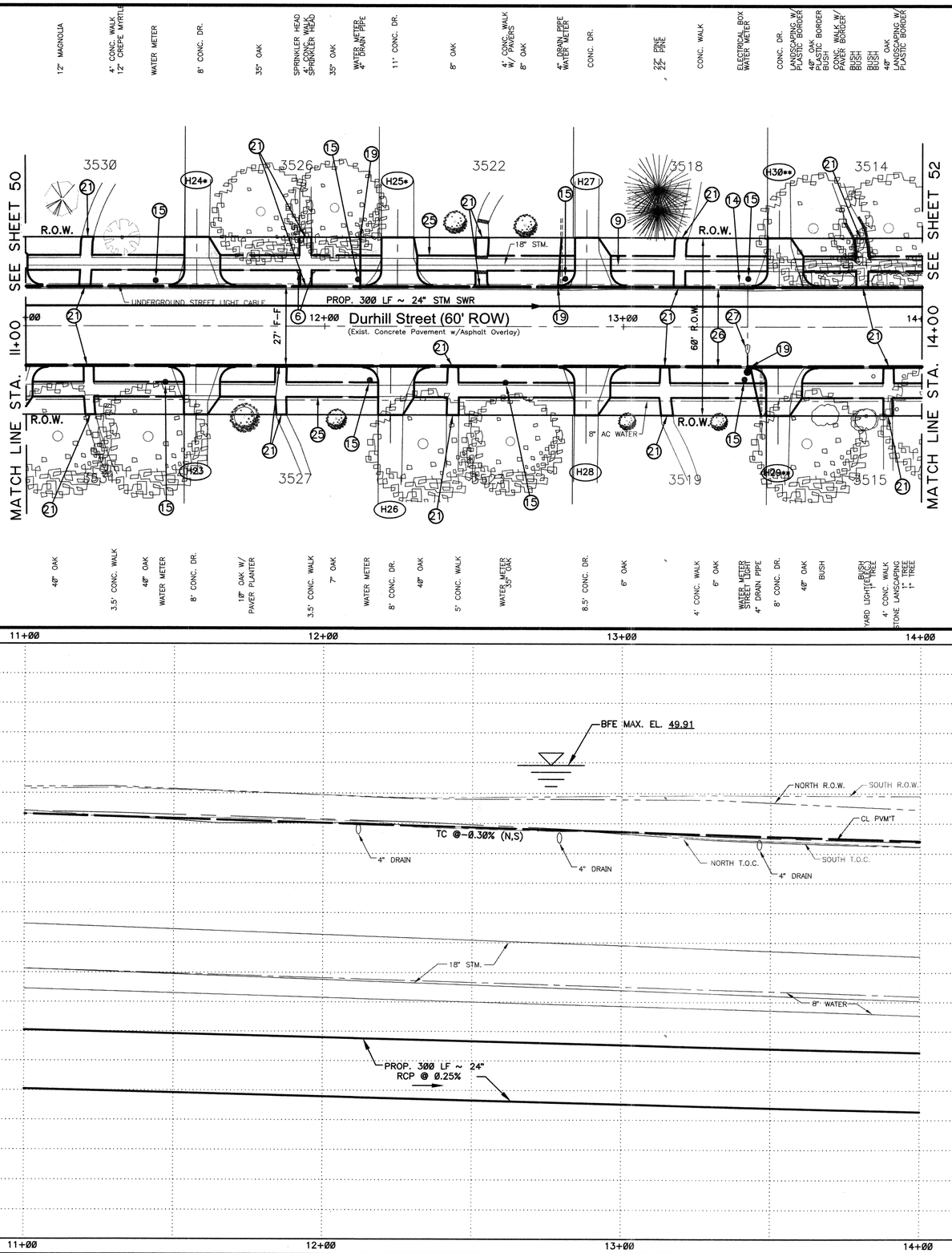
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Durhill Street
Sta. 7+50 to Sta. 11+00

WBS NO.
N-000378-0002-4
DRAWING SCALE
VERT: 1"=2' HORZ: 1"=20'
CITY OF HOUSTON PM
MARK BOARD, P.E.
SHEET No: 50 OF 122

FOR CITY OF HOUSTON USE ONLY
PUBLIC WORKS AND ENGINEERING
FILED
48978
NUMBER
TEXAS



NOTES:

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   TSARP EL. (ft) = NSRS EL. (ft) – 0.21

TBM'S:

TBM 25: Set Concrete Nail w/Shiner located in the pavement on the north side of Durhill Street at Sta. 12+08. 53, 6.85' left, Elev. 47.96.

* SEE DRIVEWAY TABLE (SHEET 121)
** SEE NOTE ON DRIVEWAY TABLE (SHEET 121)

STANDARD PROFILE LEGEND

CENTER LINE OF R.O.W. ——————
PROPERTY LINE N & E ——— — ———
PROPERTY LINE S & W ——— — ———
DITCH OR TOP OF CURB N&E ——— — ———
DITCH OR TOP OF CURB S&W ——— — ———

MK.	DESCRIPTION	DATE	DWN.	CHK.

REVISIONS

PRIVATE UTILITY LINES SHOWN
AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.

Centerpoint Energy Power Facilities — Date: 11/3/11
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Valid At Time Of Review Only

Approved for AT&T Texas/SWBT underground conduit facilities only. — Date: 11-1-11
Signature valid for one year.

Centerpoint Energy Gas Facilities — Date: 11/3/11
(Centerpoint service lines are not shown.)

Cable Company — Date:

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STATE OF TEXAS — JOHN D. RUDLOFF — 83386 — LICENSED PROFESSIONAL ENGINEER — 10/19/11

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 — Dwn By: P. Hopkins
Date: May 2011 — Chkd By: D. Jorgensen

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

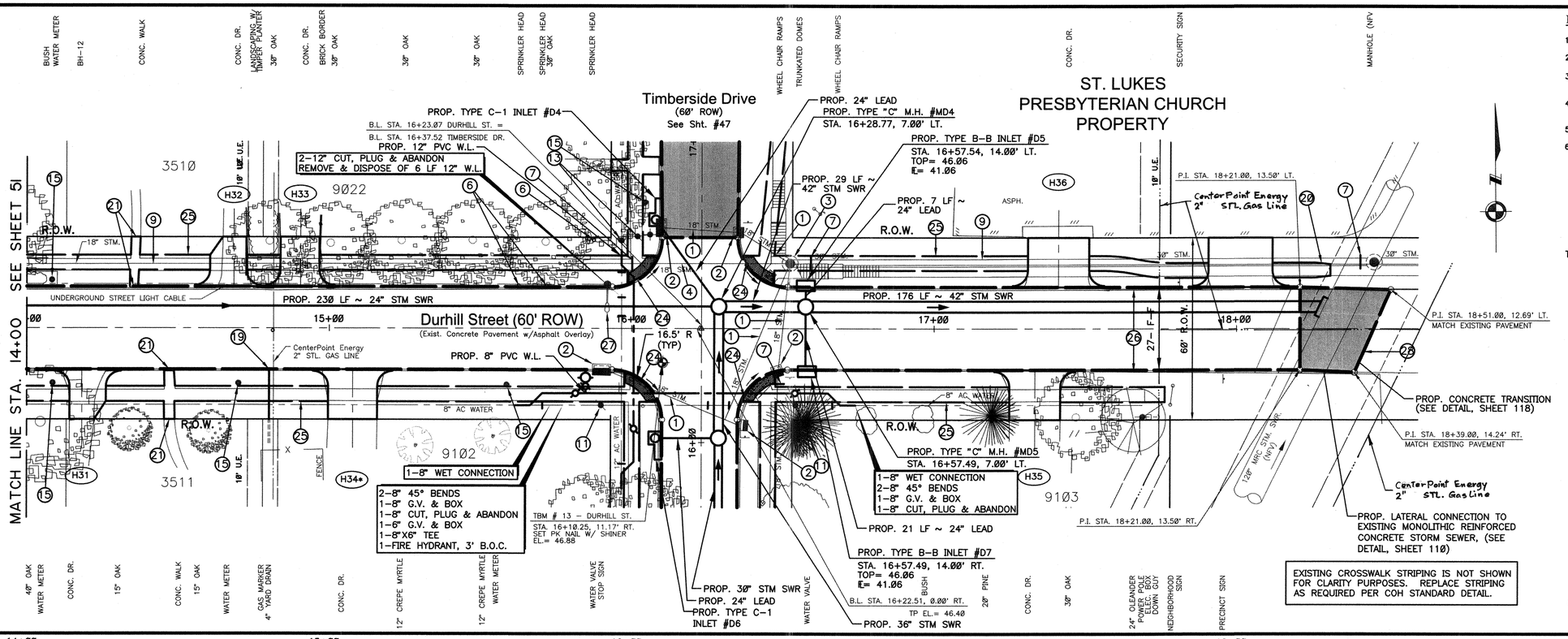
City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

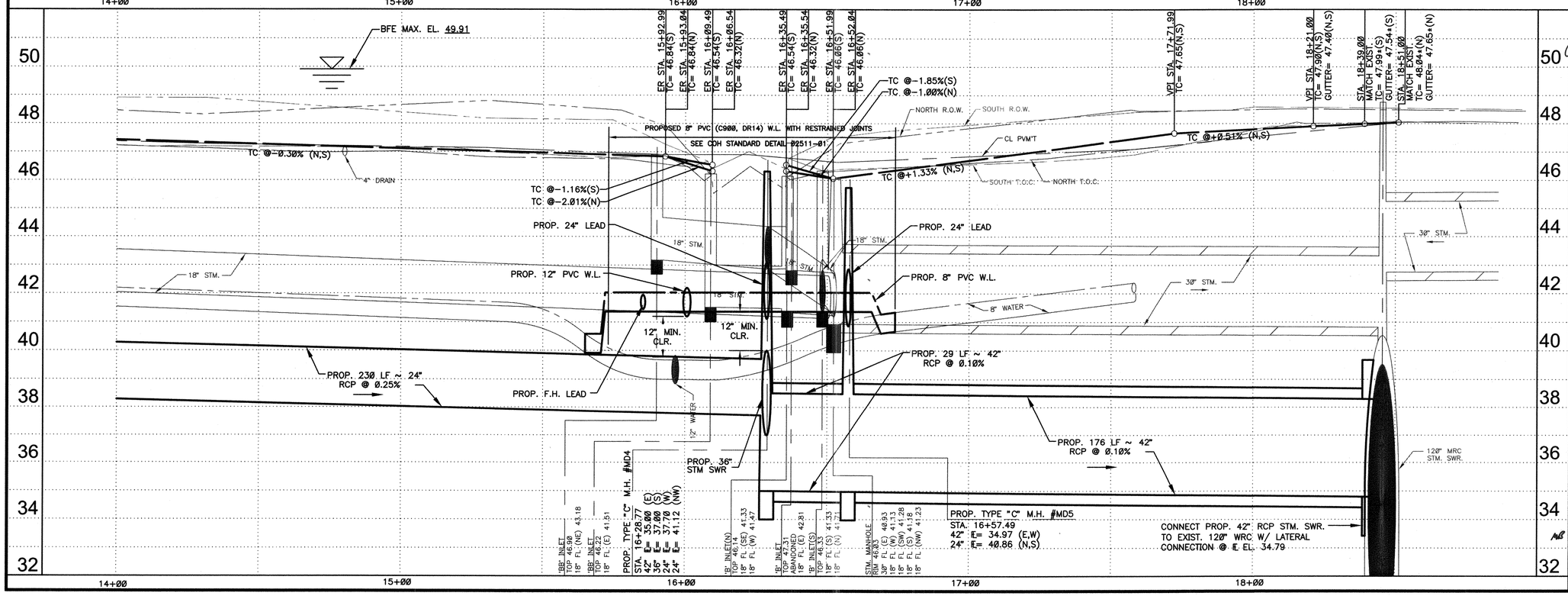
Durhill Street
Sta. 11+00 to Sta. 14+00

WBS NO.
N-000378-0002-4
DRAWING SCALE
VERT: 1"=2' HORZ: 1"=20'
CITY OF HOUSTON PM
MARK BOARD, P.E.
SHEET No: 51 OF 122

FOR CITY OF HOUSTON USE ONLY

PUBLIC WORKS AND ENGINEERING — ENGINEERING — 48978 — LICENSE NUMBER — TEXAS





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TBM'S:

TBM 13: Set PK Nail w/Shiner located in the pavement within the southwest quadrant of the Durhill Street and Timberside Drive intersection at Durhill Street Sta. 16+10.25, 11.17' right, Elev. 46.88.

PROP. CONCRETE TRANSITION (SEE DETAIL SHEET 118)

* SEE DRIVEWAY TABLE (SHEET 121)

STANDARD PROFILE LEGEND

CENTER LINE OF R.O.W.
PROPERTY LINE N & E
PROPERTY LINE S & W
DITCH OR TOP OF CURB N&E
DITCH OR TOP OF CURB S&W

MK.	DESCRIPTION	DATE	DWN.	CHK.

REVISIONS

PRIVATE UTILITY LINES SHOWN

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CenterPoint Energy Gas Facilities Date: 11/3/11
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Cable Company Date:

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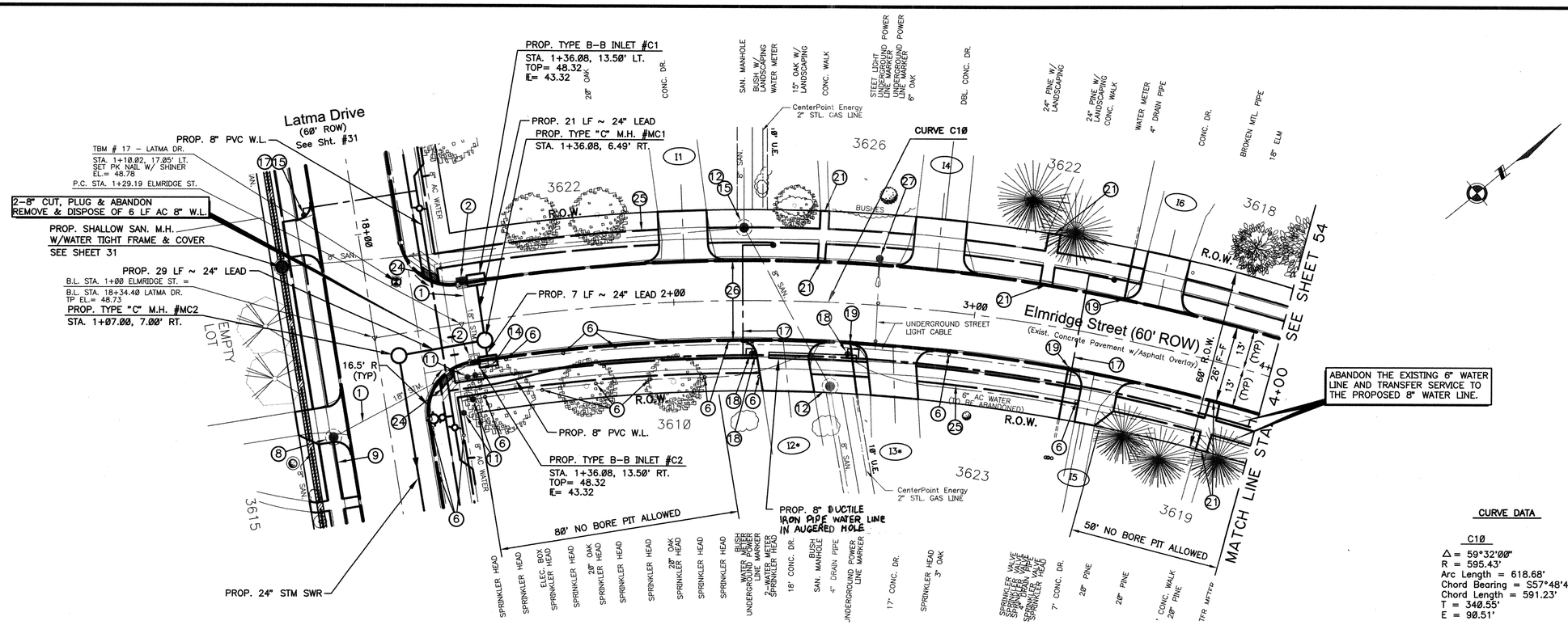
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Durhill Street
Sta. 14+00 to End

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	
DRAWING SCALE	
VERT: 1"=2' HORZ: 1"=20'	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	
SHEET No: 52 OF 122	

PUBLIC WORKS AND ENGINEERING
ACCEPTED AND FILED
48978
NUMBER
TEXAS



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PPCA
(SEE SHEETS 13 AND 14 FOR APPROXIMATE LIMITS)

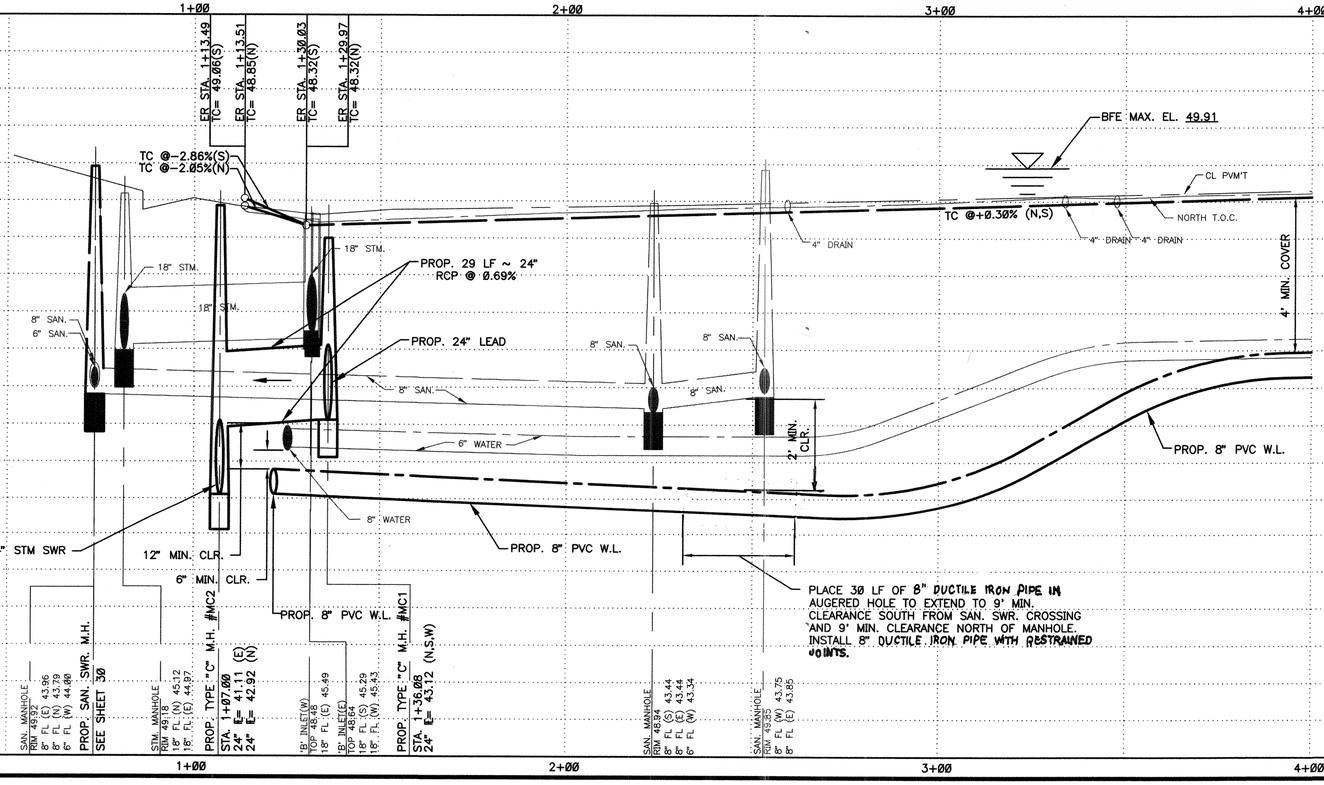
TBM'S:

TBM 17: Set PK Nail w/Shiner located in the pavement within the nortwest quadrant of the Latma Drive and Elmridge Street intersection at Latma Drive Sta. 18+73.34, 10.02' left, Elev. 48.78.

* SEE DRIVEWAY TABLE (SHEET 121)

CURVE DATA

C10
Δ = 59°32'00"
R = 595.43'
Arc Length = 618.68'
Chord Bearing = S57°48'41"W
Chord Length = 591.23'
T = 340.55'
E = 90.51'



STANDARD PROFILE LEGEND

CENTER LINE OF R.O.W.
PROPERTY LINE N & E
PROPERTY LINE S & W
DITCH OR TOP OF CURB N&E
DITCH OR TOP OF CURB S&W

MK.	DESCRIPTION	DATE	DWN.	CHK.
1	ADDED PPCA LIMITS	01/12	AS	MN

REVISIONS

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Job No.: 09-051 — Dwn By: P. Hopkins
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DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Elmridge Street
Sta. 1+00 to Sta. 4+00

WBS NO.
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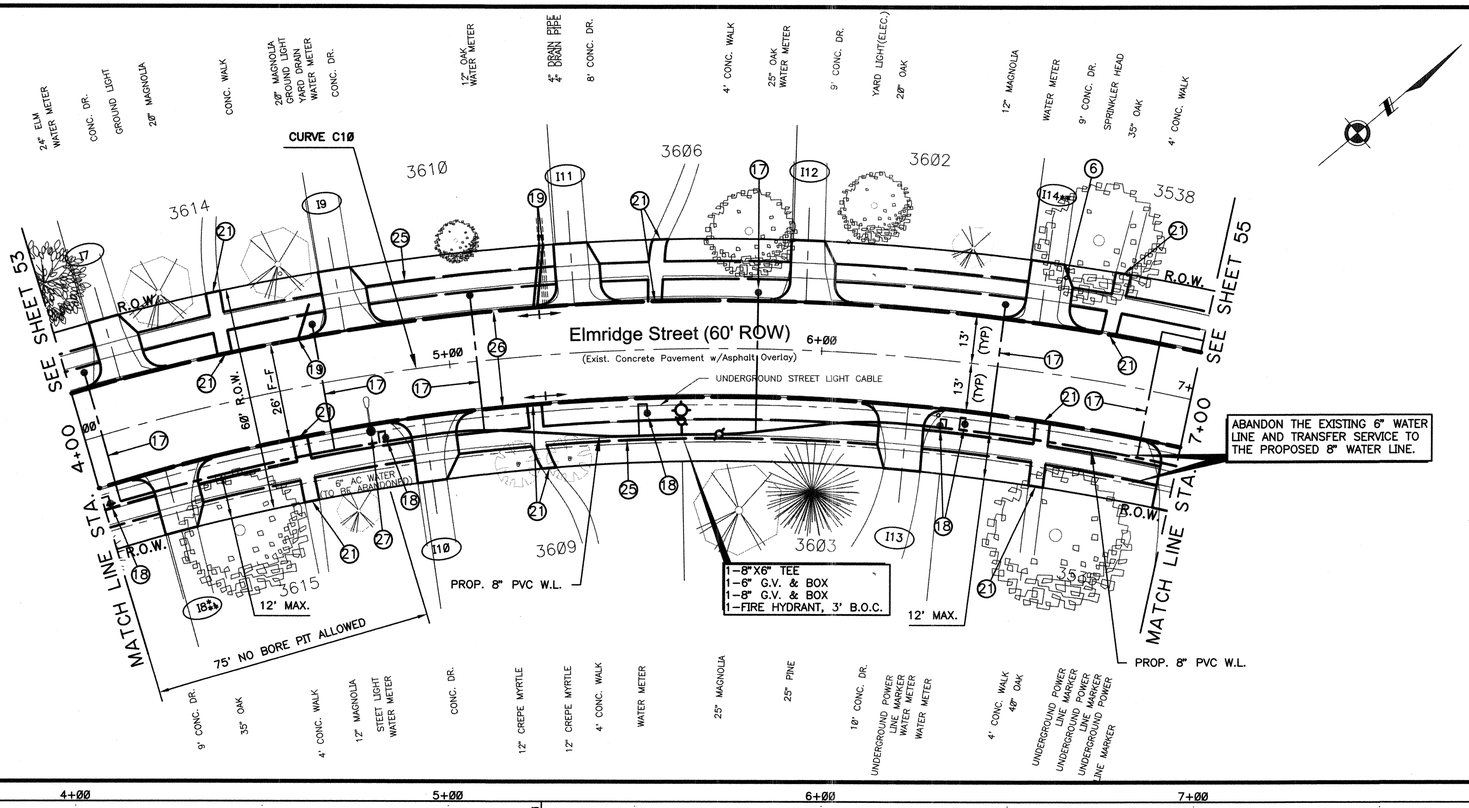
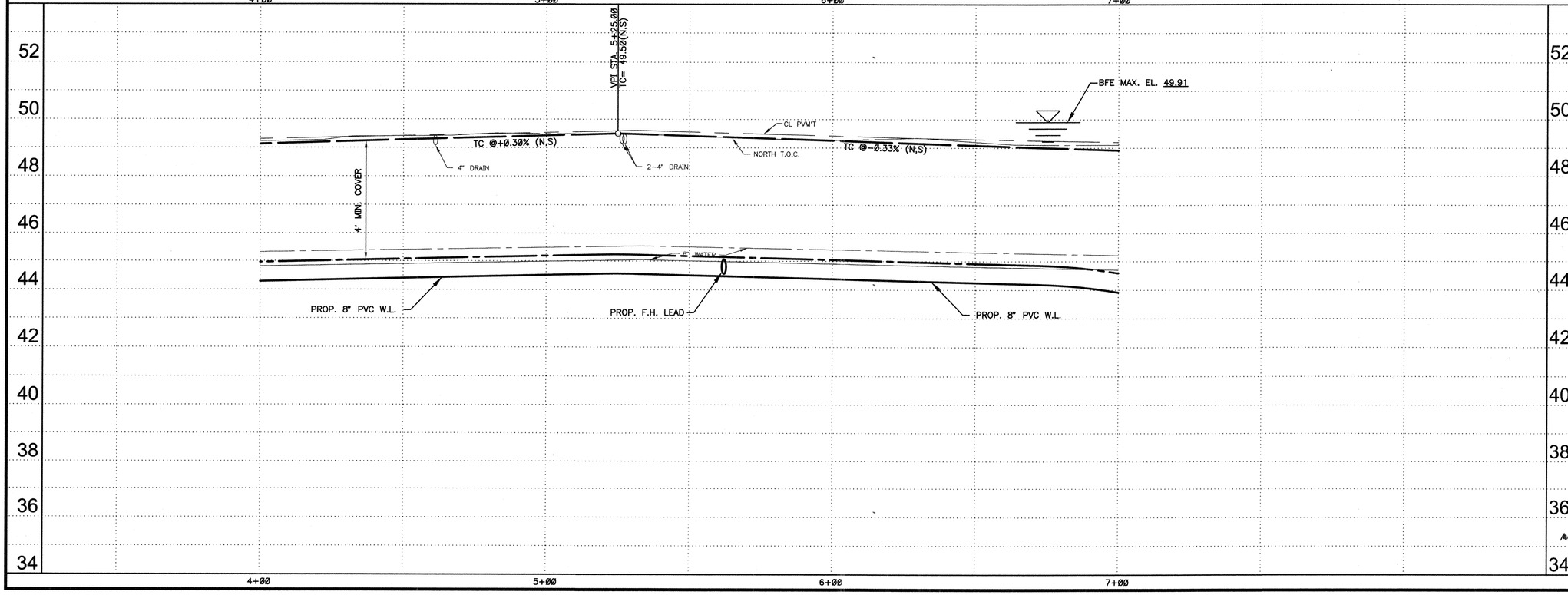
DRAWING SCALE
VERT: 1"=2' HORZ: 1"=20'
CITY OF HOUSTON PM
MARK BOARD, P.E.

FOR CITY OF HOUSTON USE ONLY
PUBLIC WORKS AND ENGINEERING — PLANS FILED — 48978 — NUMBER — TEXAS

SHEET No: 53 OF 122





NOTES:

1. SEE SHEET 4 FOR KEYED NOTE CALLOUTS
2. SEE SHEETS 5,6, &7 FOR HORIZONTAL CONTROLS
3. FOR EXISTING UNDERGROUND UTILITIES NOTES (SEE SHEET 3)
4. ALL PAVING OFFSETS ARE SYMMETRICAL ABOUT THE BASELINE UNLESS OTHERWISE NOTED.
5. SEE SHEET 121 FOR DRIVEWAY TABLE
6. ALL ELEVATIONS SHOWN IN HOUSTORM CALCULATIONS ARE IN TSARP DATUM (1988 DATUM, 2001 ADJ.). SURVEY AND PLAN ELEVATIONS ARE IN NSRS (CORS) DATUM; EQUATION TO TIE FROM NSRS (CORS) DATUM TO TSARP DATUM IS:
TSARP EL. (ft) = NSRS EL. (ft) – Ø.21

TBM'S:

TBM 16: Set PK Nail w/Shiner located in the pavement in the north lane of Elmridge Street at Sta. 6+43.69, 7.87' left, Elev. 49.Ø1.

* SEE DRIVEWAY TABLE (SHEET 121)
** SEE NOTE ON DRIVEWAY TABLE (SHEET 121)

CURVE DATA

C1Ø
△ = 59°32'ØØ"
R = 595.43'
Arc Length = 618.68'
Chord Bearing = S57°48'41"W
Chord Length = 591.23'
T = 340.55'
E = 90.51'

STANDARD PROFILE LEGEND

CENTER LINE OF R.O.W. ——————
PROPERTY LINE N & E ———— — — ————
PROPERTY LINE S & W ———— — — ————
DITCH OR TOP OF CURB N&E ———— — ————
DITCH OR TOP OF CURB S&W ———— — ————

MK.	DESCRIPTION	DATE	DWN.	CHK.

REVISIONS

PRIVATE UTILITY LINES SHOWN
AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.

Centerpoint Energy Power Facilities Date: 11/3/11
(Approved only for crossing underground ductlines, unless otherwise noted.)
Valid At Time Of Review Only

Approved for AT&T Texas/SWBT underground conduit facilities only. Date: 11-1-11
Signature valid for one year.

Centerpoint Energy Gas Facilities Date: 11/3/11
(Centerpoint service lines are not shown.)

Cable Company Date:

HDR | CLAUNCH & MILLER
Engineering Consultants
4635 Southwest Freeway, Suite 1000• Houston, Texas 77027
(713) 622-9264• Fax (713) 622-9265• www.hdrinc.com
HDR Engineering Inc. Texas Reg. No. F-754

JOHN D. RUDLOFF
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(713) 622-9264
Fax (713) 622-9265

STATE OF TEXAS — JOHN D. RUDLOFF — 83386 — LICENSED — PROFESSIONAL ENGINEER
10/9/11

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 | Dwn By: P. Hopkins
Date: May 2011 | Chkd By: D. Jorgensen

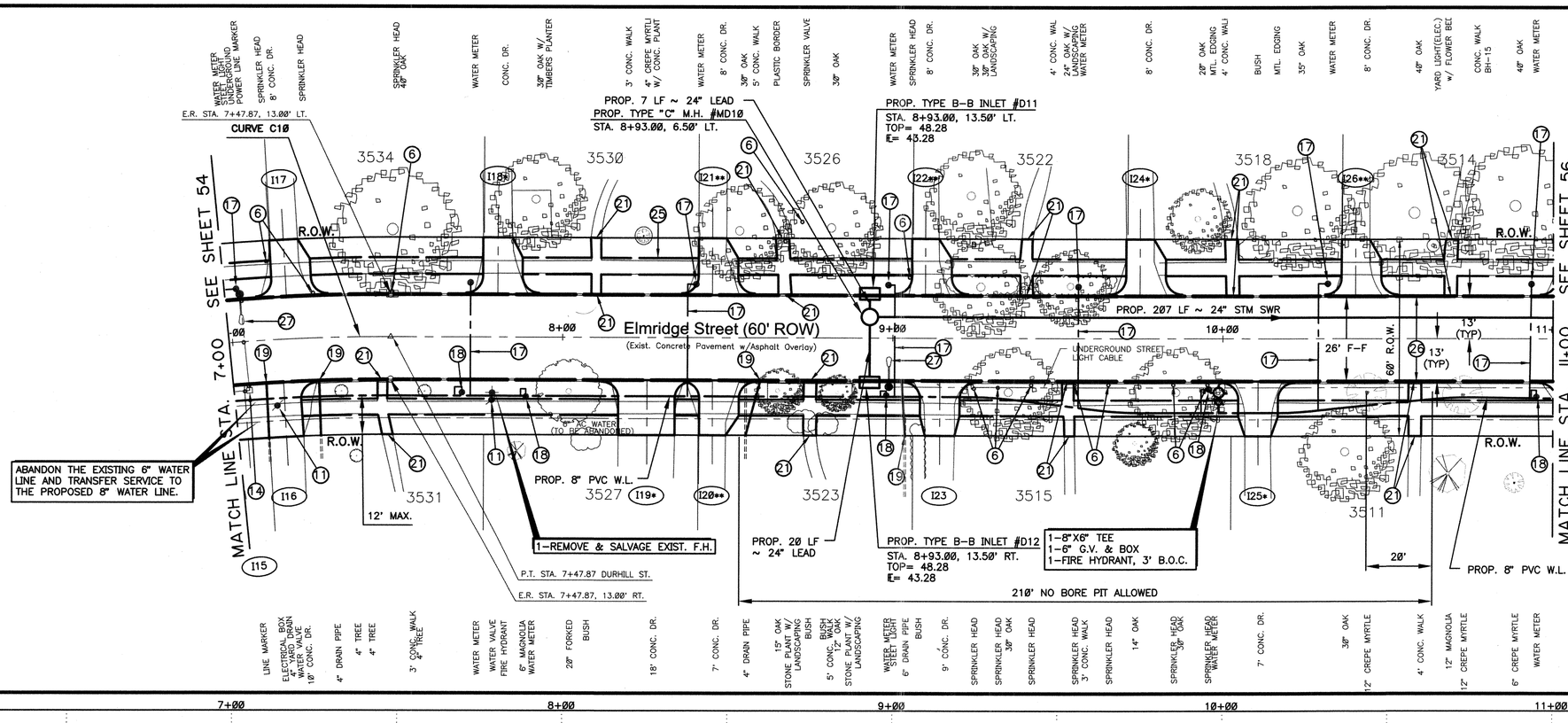
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

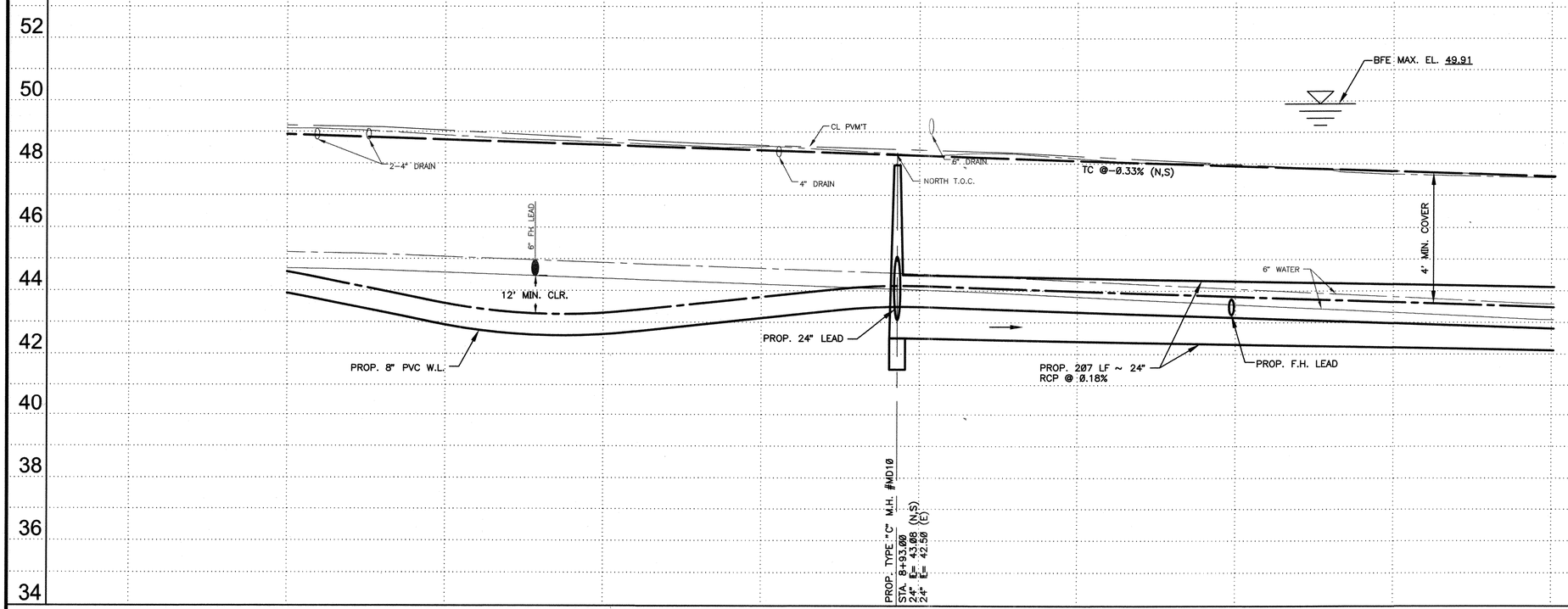
City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Elmridge Street
Sta. 4+00 to Sta. 7+00

WBS NO.
N-000378-0002-4
DRAWING SCALE
VERT: 1"=2' HORZ: 1"=20'
CITY OF HOUSTON PM
MARK BOARD, P.E.
SHEET No: 54 OF 122

FOR CITY OF HOUSTON USE ONLY
PUBLIC WORKS AND ENGINEERING — REVIEWED AND FILED — 48978 — NUMBER — TEXAS





NOTES:

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2. SEE SHEETS 5,6, &7 FOR HORIZONTAL CONTROLS
3. FOR EXISTING UNDERGROUND UTILITIES NOTES (SEE SHEET 3)
4. ALL PAVING OFFSETS ARE SYMMETRICAL ABOUT THE BASELINE UNLESS OTHERWISE NOTED.
5. SEE SHEET 121 FOR DRIVEWAY TABLE
6. ALL ELEVATIONS SHOWN IN HOUSTORM CALCULATIONS ARE IN TSARP DATUM (1988 DATUM, 2001 ADJ.). SURVEY AND PLAN ELEVATIONS ARE IN NSRS (CORS) DATUM; EQUATION TO TIE FROM NSRS (CORS) DATUM TO TSARP DATUM IS: TSARP EL. (ft) = NSRS EL. (ft) - 0.21

TBM'S:

TBM 14: Set PK Nail w/Shiner located in the pavement within the southwest quadrant of the Elmridge Street and Timberside Drive intersection at Elmridge Street Sta. 12+87.90, 11.28' right, Elev. 47.10.

TBM 16: Set PK Nail w/Shiner located in the pavement in the north lane of Elmridge Street at Sta. 6+43.69, 7.87' left, Elev. 49.01.

* SEE DRIVEWAY TABLE (SHEET 121)
** SEE NOTE ON DRIVEWAY TABLE (SHEET 121)

CURVE DATA

C10
Δ = 59°32'00"
R = 595.43'
Arc Length = 618.68'
Chord Bearing = S57°48'41"W
Chord Length = 591.23'
T = 340.55'
E = 90.51'

STANDARD PROFILE LEGEND

CENTER LINE OF R.O.W.
PROPERTY LINE N & E
PROPERTY LINE S & W
DITCH OR TOP OF CURB N&E
DITCH OR TOP OF CURB S&W

MK.	DESCRIPTION	DATE	DWN.	CHK.

REVISIONS

PRIVATE UTILITY LINES SHOWN
AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.

Centerpoint Energy Power Facilities — Date: 11/3/11
(Approved only for crossing underground ductlines, unless otherwise noted.) Valid At Time Of Review Only

Approved for AT&T Texas/SWBT underground conduit facilities only. Signature valid for one year. — Date: 11-1-11

Centerpoint Energy Gas Facilities — Date: 11/3/11
(Centerpoint service lines are not shown.)

Cable Company — Date:

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Fax (713) 622-9265

STATE OF TEXAS — JOHN D. RUDLOFF — 83386 — LICENSED — PROFESSIONAL ENGINEER — 10/19/11

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 — Dwn By: P. Hopkins
Date: May 2011 — Chkd By: D. Jorgensen

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Elmridge Street
Sta. 7+00 to Sta. 11+00

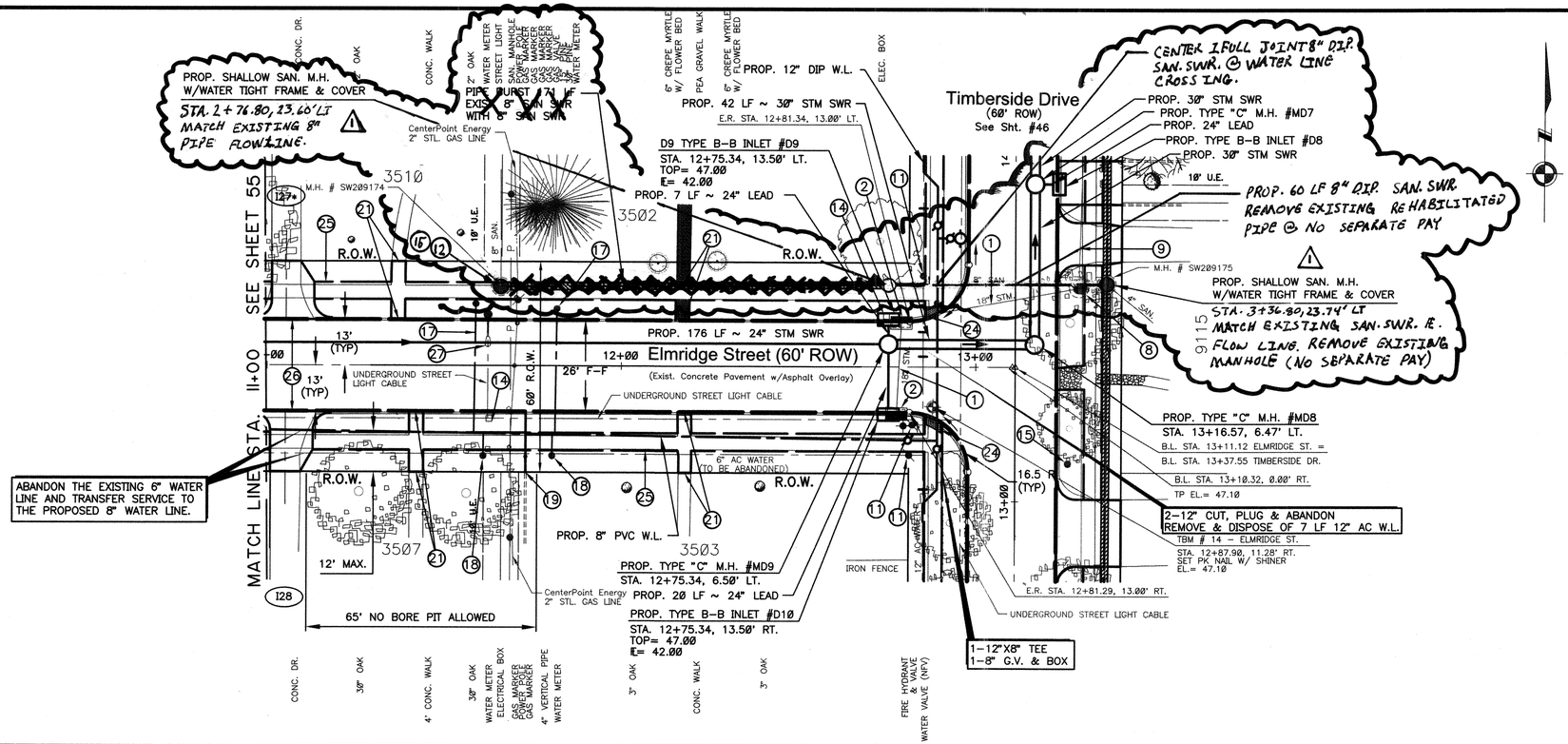
WBS NO.
N-000378-0002-4

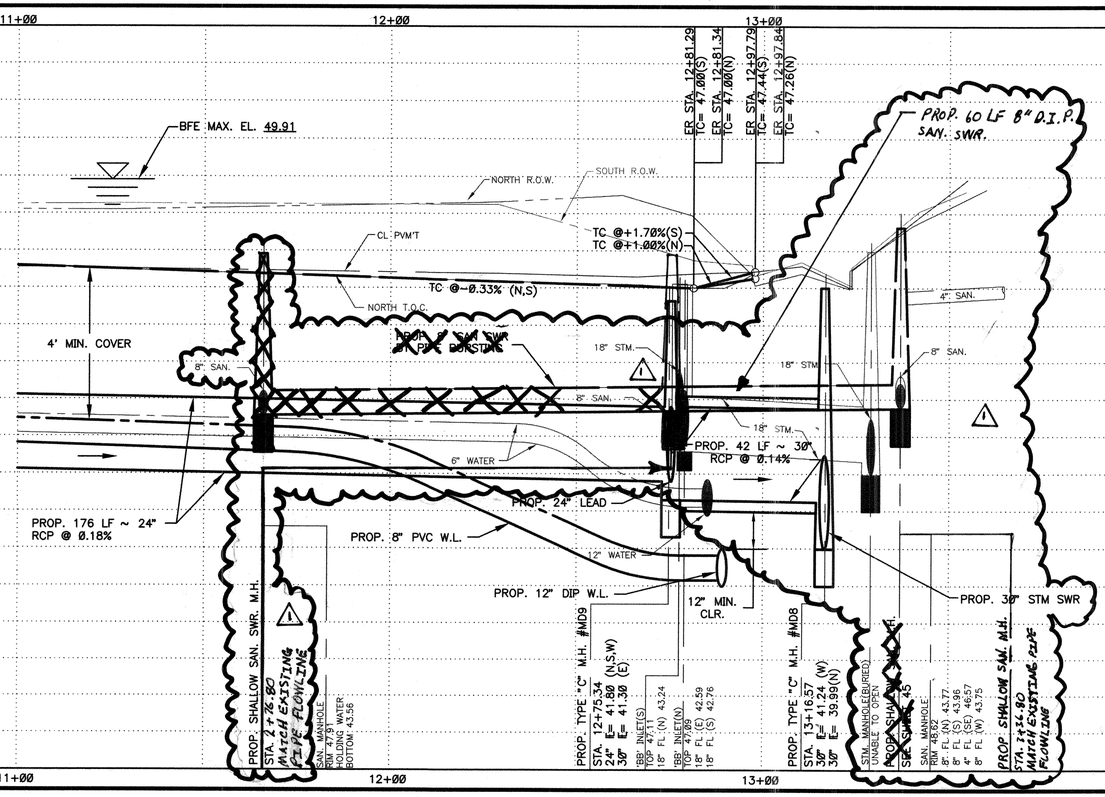
DRAWING SCALE
VERT: 1"=2' HORZ: 1"=20'

CITY OF HOUSTON PM
MARK BOARD, P.E.

FOR CITY OF HOUSTON USE ONLY
PUBLIC WORKS AND ENGINEERING — ACCEPTED AND FILED — 48978 — JOB NUMBER — TEXAS

SHEET No: 55 OF 122





NOTES:

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3. FOR EXISTING UNDERGROUND UTILITIES NOTES (SEE SHEET 3)
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5. SEE SHEET 121 FOR DRIVEWAY TABLE
6. ALL ELEVATIONS SHOWN IN HOUSTORM CALCULATIONS ARE IN TSARP DATUM (1988 DATUM, 2001 ADJ.). SURVEY AND PLAN ELEVATIONS ARE IN NSRS (CORS) DATUM; EQUATION TO TIE FROM NSRS (CORS) DATUM TO TSARP DATUM IS: TSARP EL. (ft) = NSRS EL. (ft) - 0.21

TBM'S:

TBM 14: Set PK Nail w/Shiner located in the pavement within the southwest quadrant of the Elmridge Street and Timberside Drive intersection at Elmridge Street Sta. 12+87.90, 11.28' right, Elev. 47.10.

- SEE DRIVEWAY TABLE (SHEET 121)

STANDARD PROFILE LEGEND

CENTER LINE OF R.O.W. ——————
PROPERTY LINE N & E ——— — ———
PROPERTY LINE S & W ——— — ———
DITCH OR TOP OF CURB N&E ——— — ———
DITCH OR TOP OF CURB S&W ——— — ———

MK.	DESCRIPTION	DATE	DWN.	CHK.
1	REVISED SAN. SWR.	12/22/11	AS	HW

REVISIONS

PRIVATE UTILITY LINES SHOWN
AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.

Centerpoint Energy Power Facilities — Date: 11/3/11
(Approved only for crossing underground ductlines, unless otherwise noted.) Valid At Time Of Review Only

Approved for AT&T Texas/SWBT underground conduit facilities only. Signature valid for one year. — Date: 11-1-11

Centerpoint Energy Gas Facilities — Date: 11/3/11
(Centerpoint service lines are not shown.)

Cable Company — Date:

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Fax (713) 622-9265

STATE OF TEXAS — JOHN D. RUDLOFF — 83386 — LICENSED PROFESSIONAL ENGINEER — 10/9/11

SURVEYED BY: Landtech Consultants, Inc. FB NO. PB#5543

Job No.: 09-051 — Dwn By: P. Hopkins
Date: May 2011 — Chkd By: D. Jorgensen

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

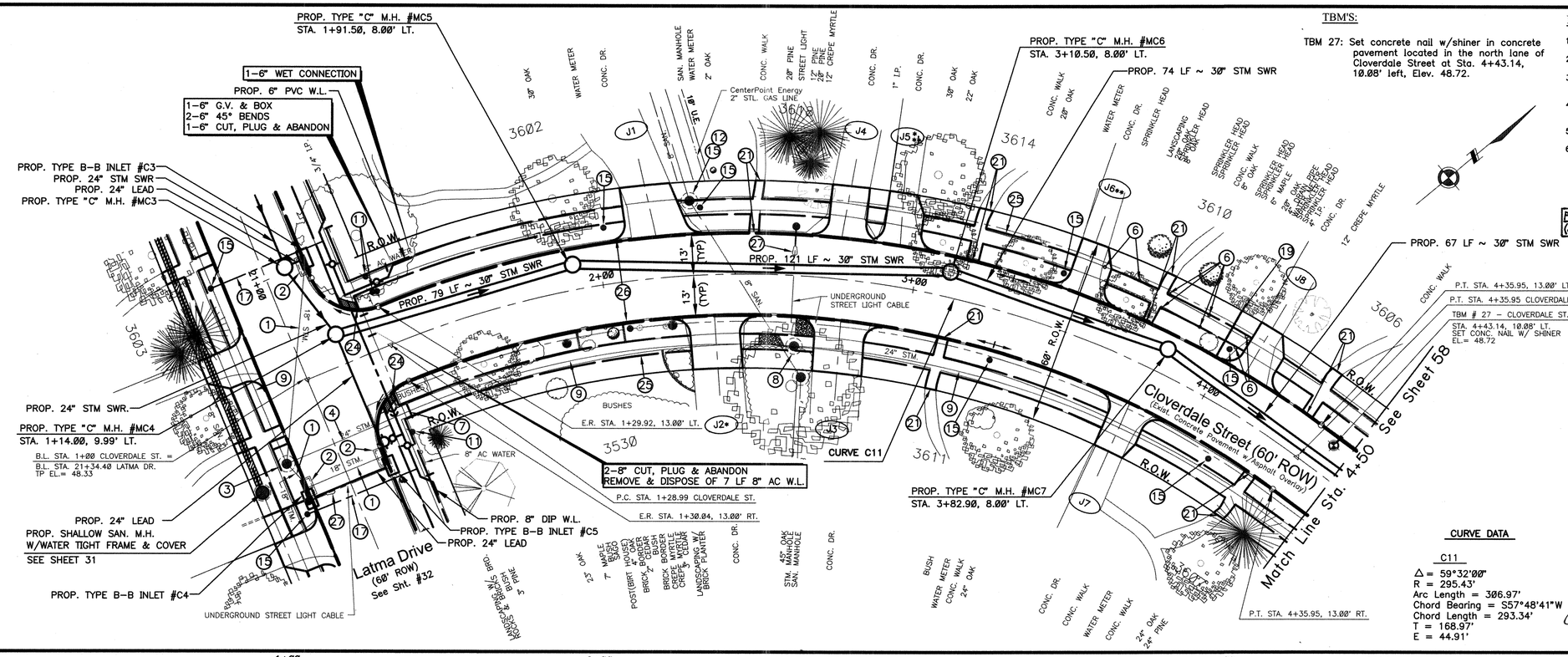
Elmridge Street
Sta. 11+00 to End

WBS NO.	N-000378-0002-4
DRAWING SCALE	VERT: 1"=2' HORZ: 1"=20'
CITY OF HOUSTON PM	MARK BOARD, P.E.
SHEET No:	56 OF 122

FOR CITY OF HOUSTON USE ONLY

PUBLIC WORKS AND ENGINEERING — REVIEWED AND FILED — 48978 — NUMBER — TEXAS

STATE OF TEXAS — HARRY BRIAN WALKER — 53225 — REGISTERED PROFESSIONAL ENGINEER — 12/22/11



TBM'S:

TBM 27: Set concrete nail w/shiner in concrete pavement located in the north lane of Cloverdale Street at Sta. 4+43.14, 10.08' left, Elev. 48.72.

NOTES:

1. SEE SHEET 4 FOR KEYED NOTE CALLOUTS
2. SEE SHEETS 5,6, &7 FOR HORIZONTAL CONTROLS
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TSARP EL. (ft) = NSRS EL. (ft) - 0.21

PPCA
(SEE SHEETS 13 AND 14 FOR APPROXIMATE LIMITS)

* SEE DRIVEWAY TABLE (SHEET 121)
** SEE NOTE ON DRIVEWAY TABLE (SHEET 121)

CURVE DATA

C11
Δ = 59°32'00"
R = 295.43'
Arc Length = 306.97'
Chord Bearing = S57°48'41"W
Chord Length = 293.34'
T = 168.97'
E = 44.91'

STANDARD PROFILE LEGEND

CENTER LINE OF R.O.W.
PROPERTY LINE N & E
PROPERTY LINE S & W
DITCH OR TOP OF CURB N&E
DITCH OR TOP OF CURB S&W

MK.	DESCRIPTION	DATE	DWN.	CHK.
1	ADDED PPCA LIMITS	01/12	AS	HW

REVISIONS

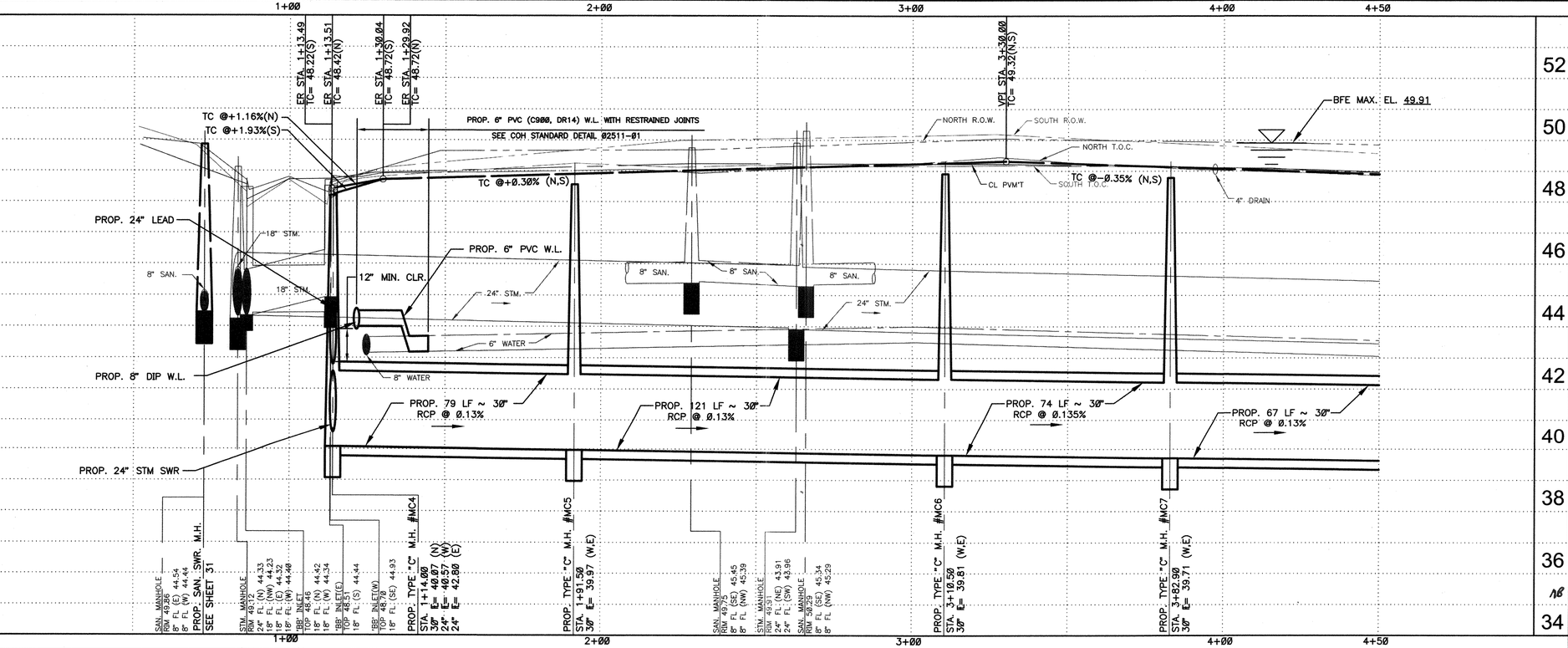
PRIVATE UTILITY LINES SHOWN
AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.

CenterPoint Energy Power Facilities Date: 11/3/11
(Approved only for crossing underground ductlines, unless otherwise noted.)
Valid At Time Of Review Only

Approved for AT&T Texas/SWBT underground conduit facilities only. Date: 11-1-11
Signature valid for one year.

CenterPoint Energy Gas Facilities Date: 11/3/11
(Centerpoint service lines are not shown.)

Cable Company Date:



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STATE OF TEXAS
JOHN D. RUDLOFF
83386
LICENSED
PROFESSIONAL ENGINEER
10/19/11

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 Dwn By: P. Hopkins
Date: May 2011 Chkd By: D. Jorgensen

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Cloverdale Street
Sta. 1+00 to Sta. 4+50

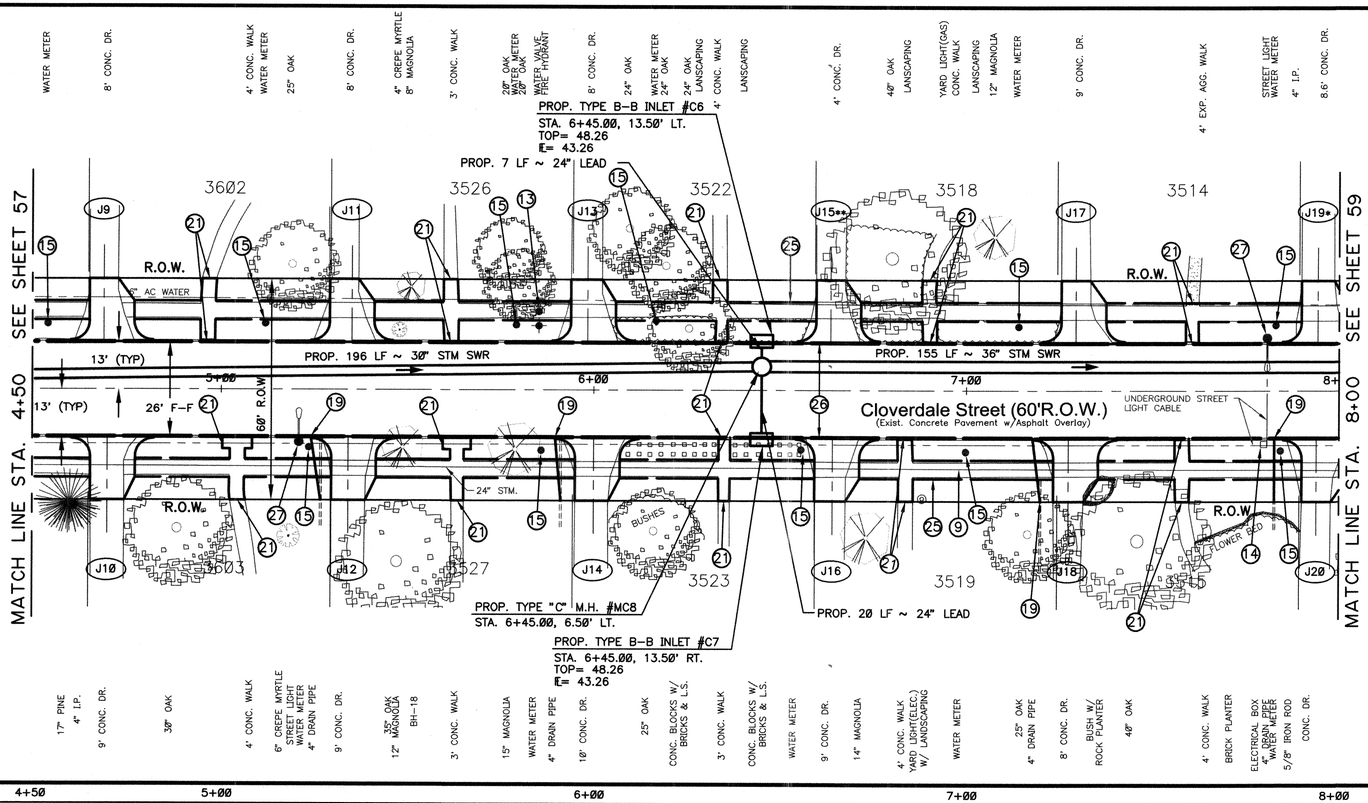
WBS NO.
N-000378-0002-4

DRAWING SCALE
VERT: 1"=2' HORZ: 1"=20'

CITY OF HOUSTON PM
MARK BOARD, P.E.

SHEET No: 57 OF 122

FOR CITY OF HOUSTON USE ONLY
PUBLIC WORKS AND ENGINEERING
ACCEPTED AND FILED
48978
LICENSE NUMBER
STATE OF TEXAS



TBM'S:

TBM 15: Set 3/8" IR w/Cap located behind the curb at on the east side of Timberside Drive at the Cloverdale Street intersection, Timberside Dr. Sta. 10+47.19, 15.59' right, elev. 48.15.

TBM 27: Set concrete nail w/shiner in concrete pavement located in the north lane of Cloverdale Street at Sta. 4+43.14, 10.08' left, Elev. 48.72.

NOTES:

1. SEE SHEET 4 FOR KEYED NOTE CALLOUTS
2. SEE SHEETS 5,6, &7 FOR HORIZONTAL CONTROLS
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4. ALL PAVING OFFSETS ARE SYMMETRICAL ABOUT THE BASELINE UNLESS OTHERWISE NOTED.
5. SEE SHEET 121 FOR DRIVEWAY TABLE
6. ALL ELEVATIONS SHOWN IN HOUSTORM CALCULATIONS ARE IN TSARP DATUM (1988 DATUM, 2001 ADJ.). SURVEY AND PLAN ELEVATIONS ARE IN NSRS (CORS) DATUM; EQUATION TO TIE FROM NSRS (CORS) DATUM TO TSARP DATUM IS:
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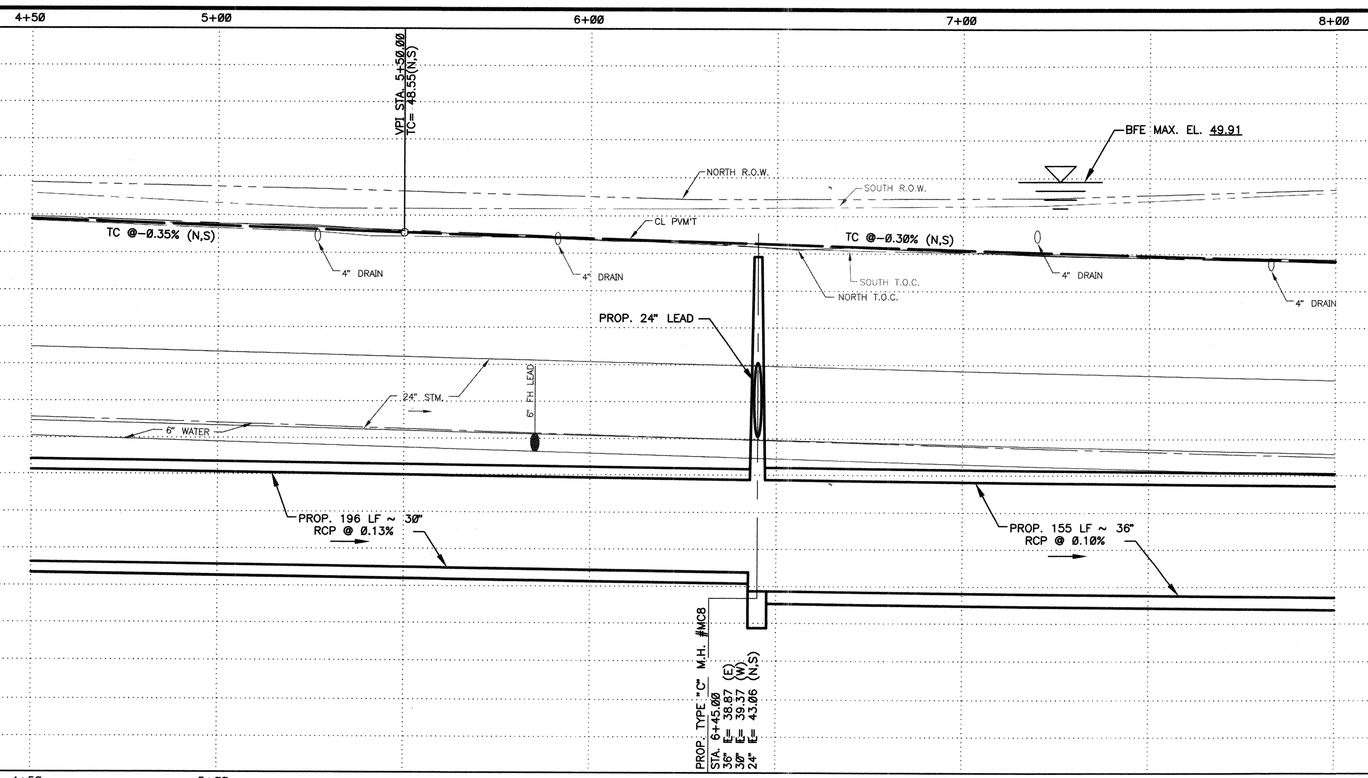
* SEE DRIVEWAY TABLE (SHEET 121)
** SEE NOTE ON DRIVEWAY TABLE (SHEET 121)



STANDARD PROFILE LEGEND

CENTER LINE OF R.O.W. ——————
PROPERTY LINE N & E ———— — —
PROPERTY LINE S & W — — — —
DITCH OR TOP OF CURB N&E ———— —
DITCH OR TOP OF CURB S&W — — —

MK.	DESCRIPTION	DATE	DWN.	CHK.

REVISIONS

PRIVATE UTILITY LINES SHOWN
AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.

Centerpoint Energy Power Facilities — Date: 11/3/11
(Approved only for crossing underground ductlines, unless otherwise noted.)
Valid At Time Of Review Only

Approved on AT&T Texas/SWBT underground conduit facilities only. — Date: 11-1-11
Signature valid for one year.

Centerpoint Energy Gas Facilities — Date: 11/3/11
(Centerpoint service lines are not shown.)

Cable Company — Date:

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STATE OF TEXAS — JOHN D. RUDLOFF — 83386 — LICENSED PROFESSIONAL ENGINEER
10/19/11

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 — Dwn By: P. Hopkins
Date: May 2011 — Chkd By: D. Jorgensen

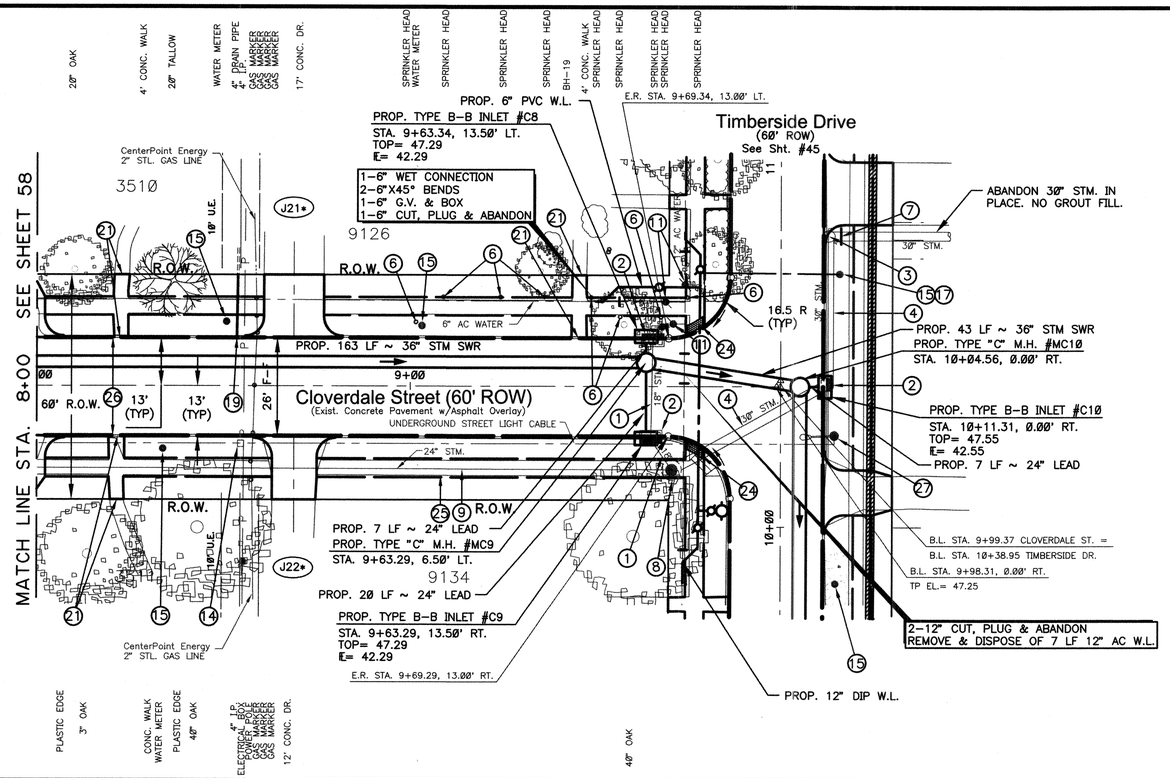
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

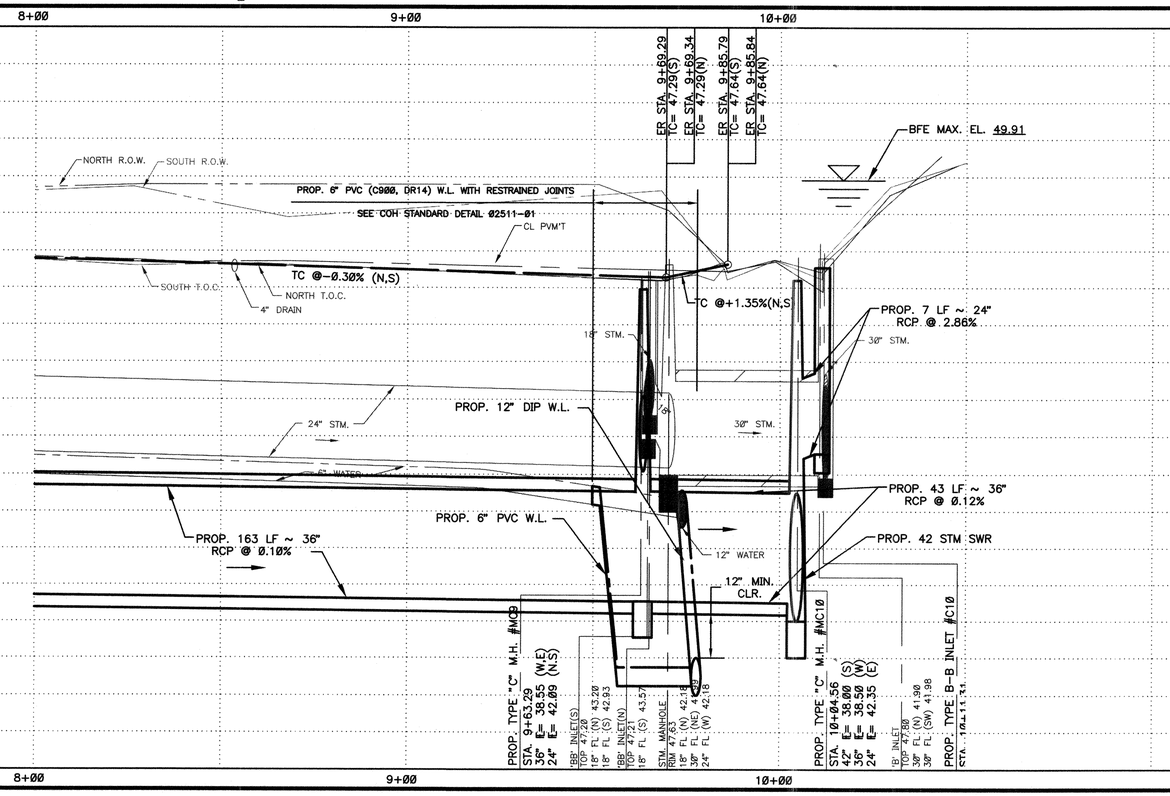
City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Cloverdale Street
4+50 To 8+00

WBS NO.
N-000378-0002-4
DRAWING SCALE
VERT: 1"=2' HORZ: 1"=20'
CITY OF HOUSTON PM
MARK BOARD, P.E.
SHEET No: 58 OF 122

FOR CITY OF HOUSTON USE ONLY
PUBLIC WORKS AND ENGINEERING — PLANS FILED — 48978 — NUMBER — TEXAS





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TBM'S:

TBM 15: Set 3/8" IR w/Cap located behind the curb at on the east side of Timberside Drive at the Cloverdale Street intersection, Timberside Dr. Sta. 10+47.19, 15.59' right, elev. 48.15.

* SEE DRIVEWAY TABLE (SHEET 121)

STANDARD PROFILE LEGEND

CENTER LINE OF R.O.W. ——————
PROPERTY LINE N & E ———— — ————
PROPERTY LINE S & W ———— — ————
DITCH OR TOP OF CURB N&E ———— — ————
DITCH OR TOP OF CURB S&W ———— — ————

MK.	DESCRIPTION	DATE	DWN.	CHK.

REVISIONS

PRIVATE UTILITY LINES SHOWN
AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.

Centerpoint Energy Power Facilities Date: 11/3/11
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Valid At Time Of Review Only

Approved for AT&T Texas/SWBT underground conduit facilities only. Date: 11-1-11
Signature valid for one year.

Centerpoint Energy Gas Facilities Date: 11/3/11
(Centerpoint service lines are not shown.)

Cable Company Date:

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STATE OF TEXAS — JOHN D. RUDLOFF — 83386 — LICENSED PROFESSIONAL ENGINEER — 10/19/11

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 Dwn By: P. Hopkins
Date: May 2011 Chkd By: D. Jorgensen

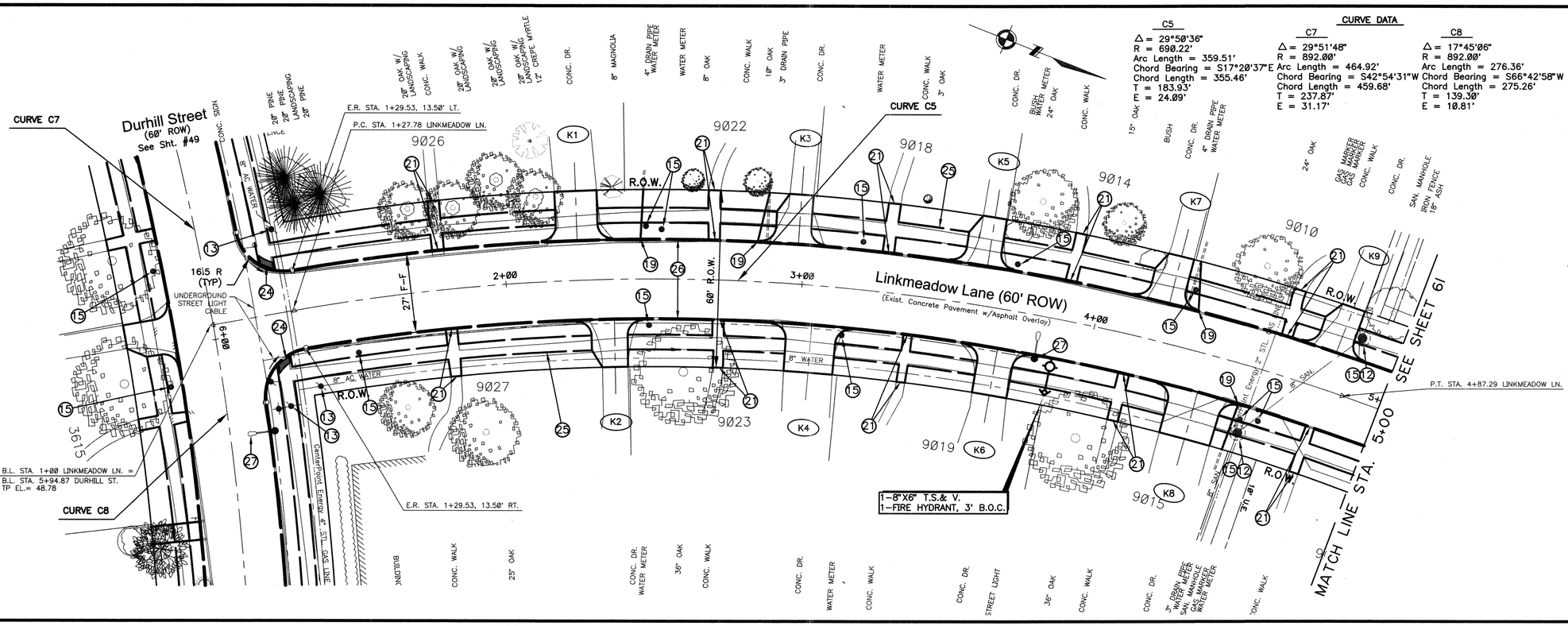
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Cloverdale Street
Sta. 8+00 to End

WBS NO.
N-000378-0002-4
DRAWING SCALE
VERT: 1"=2' HORZ: 1"=20'
CITY OF HOUSTON PM
MARK BOARD, P.E.
SHEET No: 59 OF 122

FOR CITY OF HOUSTON USE ONLY
PUBLIC WORKS AND ENGINEERING — ACCEPTED AND FILED — 48978 — NUMBER — TEXAS



CURVE DATA

C5	C7	C8
Δ = 29°50'36"	Δ = 29°51'48"	Δ = 17°45'06"
R = 690.22'	R = 892.00'	R = 892.00'
Arc Length = 359.51'	Arc Length = 464.92'	Arc Length = 276.36'
Chord Bearing = S17°20'37"E	Chord Bearing = S42°54'31"W	Chord Bearing = S66°42'58"W
Chord Length = 355.46'	Chord Length = 459.68'	Chord Length = 275.26'
T = 183.93'	T = 237.87'	T = 139.30'
E = 24.09'	E = 31.17'	E = 10.81'

NOTES:

1. SEE SHEET 4 FOR KEYED NOTE CALLOUTS
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3. FOR EXISTING UNDERGROUND UTILITIES NOTES (SEE SHEET 3)
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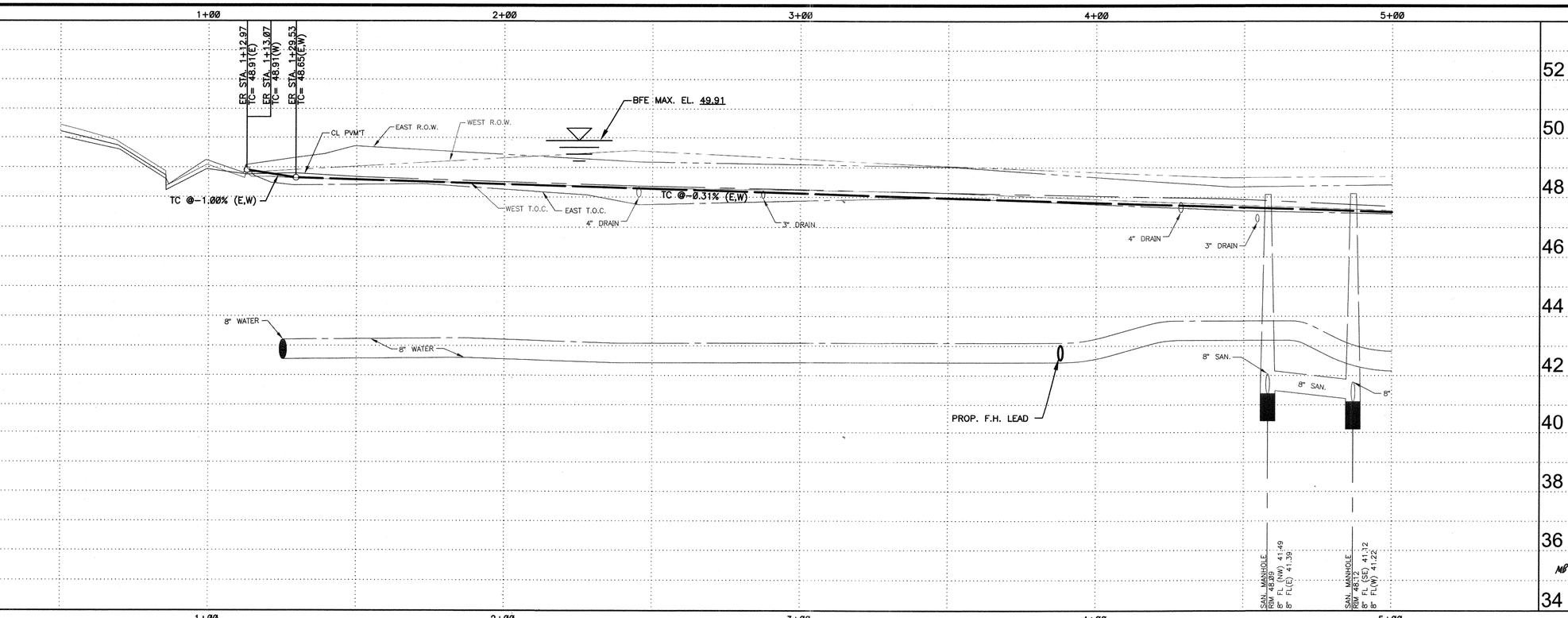
   TSARP EL. (ft) = NSRS EL. (ft) – 0.21

TBM'S:

TBM 9: Set 3/8" IR w/Cap located behind the curb at Linkmeadow Lane Sta. 1+34.53, 16.74' right, Elev. 48.70.



STANDARD PROFILE LEGEND

CENTER LINE OF R.O.W.
PROPERTY LINE N & E
PROPERTY LINE S & W
DITCH OR TOP OF CURB N&E
DITCH OR TOP OF CURB S&W

MK.	DESCRIPTION	DATE	DWN.	CHK.

REVISIONS

PRIVATE UTILITY LINES SHOWN
AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.

Centerpoint Energy Power Facilities Date: 11/3/11
(Approved only for crossing underground ductlines, unless otherwise noted.)
Valid At Time Of Review Only

Date: 11-1-11
AT&T Texas/SWBT
Approved for AT&T Texas/SWBT underground conduit facilities only.
Signature valid for one year.

Centerpoint Energy Gas Facilities Date: 11/3/11
(Centerpoint service lines are not shown.)

Cable Company Date:

HDR | CLAUNCH & MILLER
Engineering Consultants
4635 Southwest Freeway, Suite 1000• Houston, Texas 77027
(713) 622-9264• Fax (713) 622-9265• www.hdrinc.com
HDR Engineering Inc. Texas Reg. No. F-754

JOHN D. RUDLOFF
4635 Southwest Freeway
Suite 1000
Houston, Texas 77027
(713) 622-9264
Fax (713) 622-9265

STATE OF TEXAS — JOHN D. RUDLOFF — 83389 — LICENSED PROFESSIONAL ENGINEER — 10/19/11

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051	Dwn By: P. Hopkins
Date: May 2011	Chkd By: D. Jorgensen

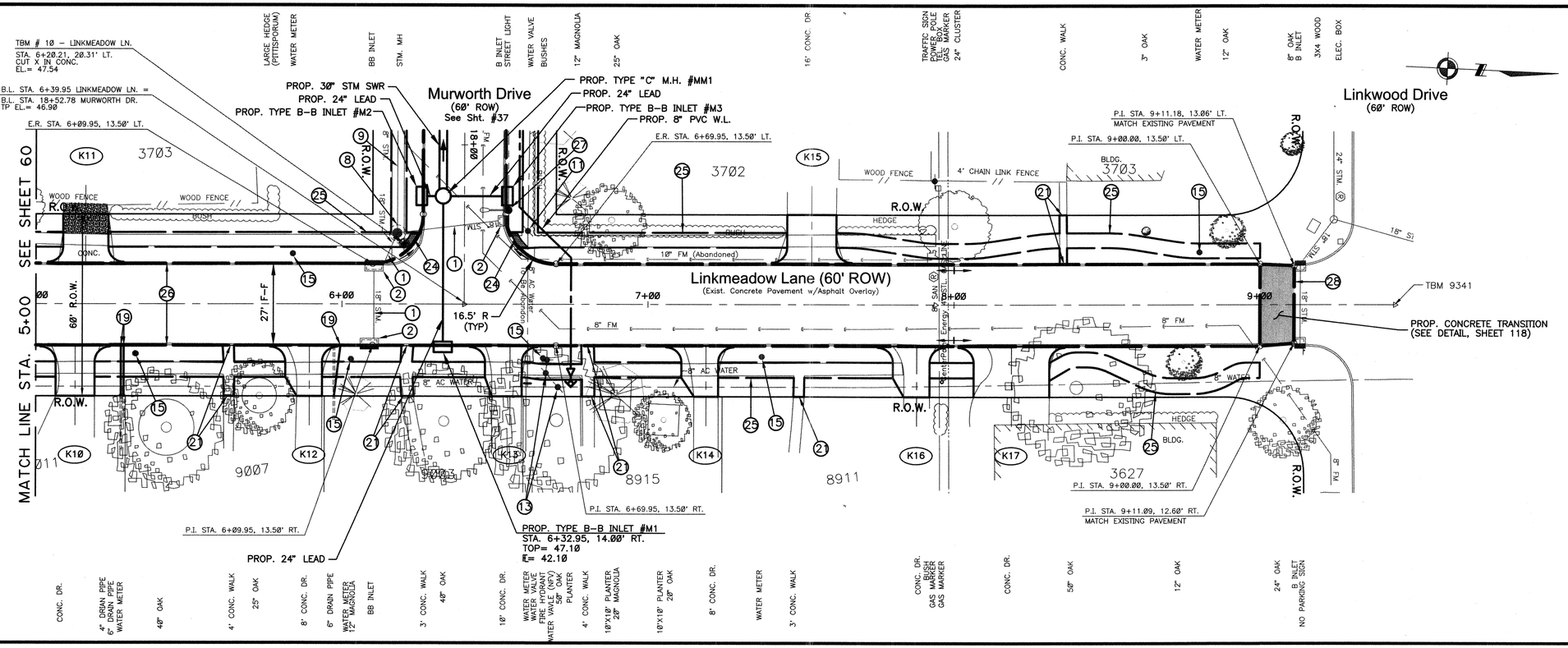
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

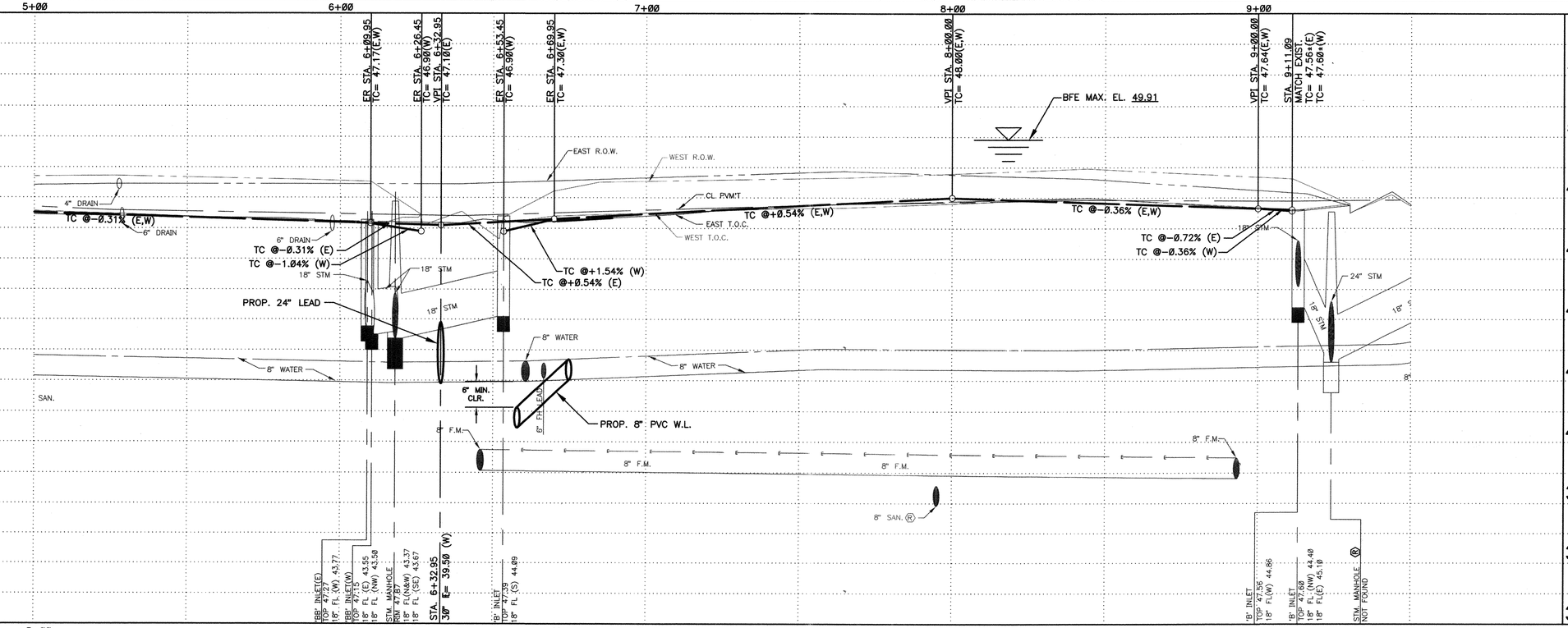
City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Linkmeadow Lane
Sta. 1+00 to Sta. 5+00

WBS NO.	N-000378-0002-4
DRAWING SCALE	VERT: 1"=2' HORZ: 1"=20'
CITY OF HOUSTON PM	MARK BOARD, P.E.
SHEET No:	60 OF 122

FOR CITY OF HOUSTON USE ONLY
PUBLIC WORKS AND ENGINEERING — APPROVED AND FILED — 48978 — CONTROL NUMBER — EXAMINED





NOTES:

1. SEE SHEET 4 FOR KEYED NOTE CALLOUTS
2. SEE SHEETS 5,6, &7 FOR HORIZONTAL CONTROLS
3. FOR EXISTING UNDERGROUND UTILITIES NOTES (SEE SHEET 3)
4. ALL PAVING OFFSETS ARE SYMMETRICAL ABOUT THE BASELINE UNLESS OTHERWISE NOTED.
5. SEE SHEET 121 FOR DRIVEWAY TABLE
6. ALL ELEVATIONS SHOWN IN HOUSTORM CALCULATIONS ARE IN TSARP DATUM (1988 DATUM, 2001 ADJ.). SURVEY AND PLAN ELEVATIONS ARE IN NSRS (CORS) DATUM; EQUATION TO TIE FROM NSRS (CORS) DATUM TO TSARP DATUM IS:
   TSARP EL. (ft) = NSRS EL. (ft) – 0.21

TBM'S:

TBM 10: Cut X in concrete sidewalk located in southwest corner of Murworth Drive and Linkmeadow Lane at Murworth Drive Sta. 18+32.46, 19.74' right, Elev. 47.54.

TBM 9341: PK Nail W/Shiner at the Intersection of Linkwood Drive and Linkmeadow Lane at Linkmeadow Lane Sta. 9+43.95 Elev. 48.19.

PROP. CONCRETE TRANSITION (SEE DETAIL SHEET 118)

STANDARD PROFILE LEGEND

CENTER LINE OF R.O.W.
PROPERTY LINE N & E
PROPERTY LINE S & W
DITCH OR TOP OF CURB N&E
DITCH OR TOP OF CURB S&W

MK.	DESCRIPTION	DATE	DWN.	CHK.

REVISIONS

PRIVATE UTILITY LINES SHOWN
AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.

Centerpoint Energy Power Facilities — Date: 11/3/11
(Approved only for crossing underground ductlines, unless otherwise noted.)
Valid At Time Of Review Only

Approved for AT&T Texas/SWBT underground conduit facilities only. — Date: 11-1-11
Signature valid for one year.

Centerpoint Energy Gas Facilities — Date: 11/3/11
(Centerpoint service lines are not shown.)

Cable Company — Date:

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STATE OF TEXAS — JOHN D. RUDLOFF — 83386 — LICENSED PROFESSIONAL ENGINEER
10/19/11

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 — Dwn By: P. Hopkins
Date: May 2011 — Chkd By: D. Jorgensen

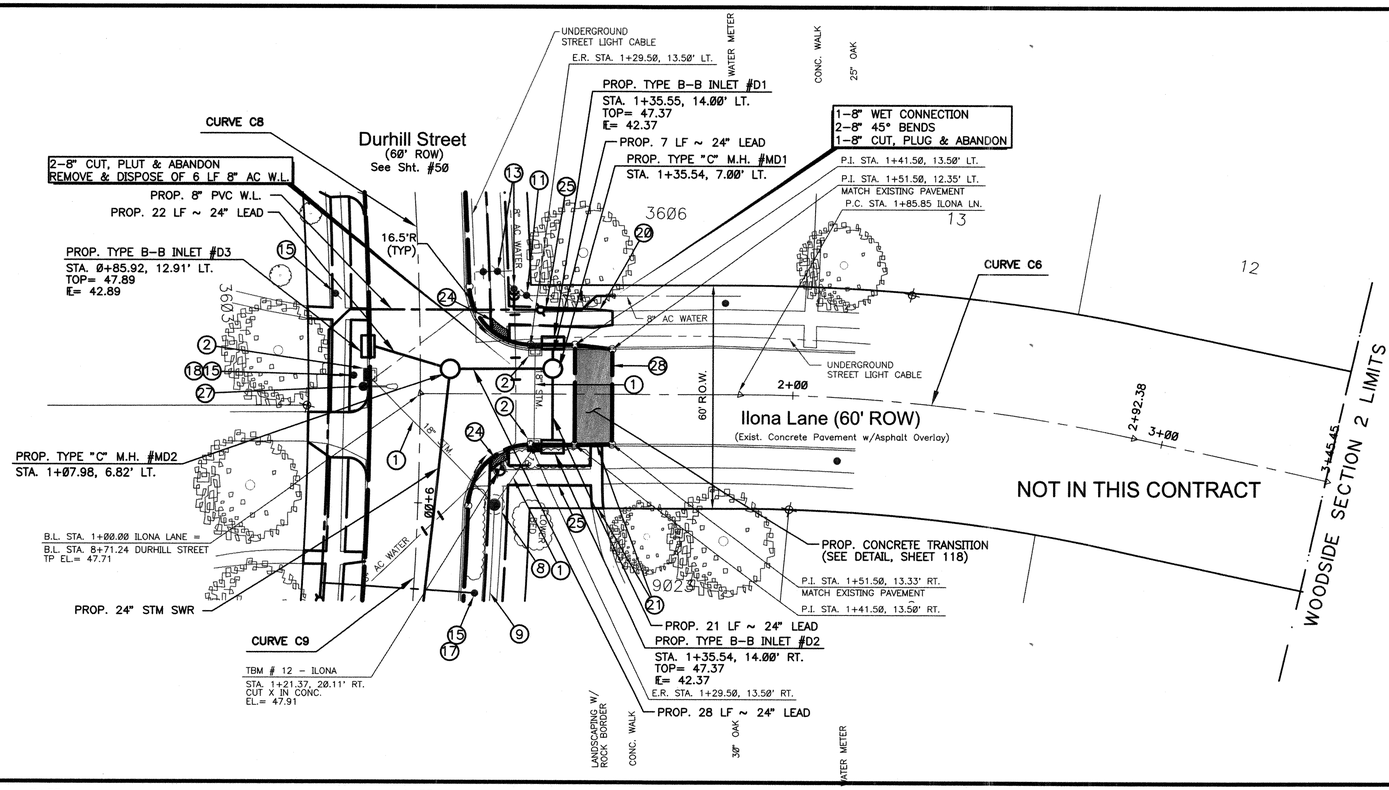
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

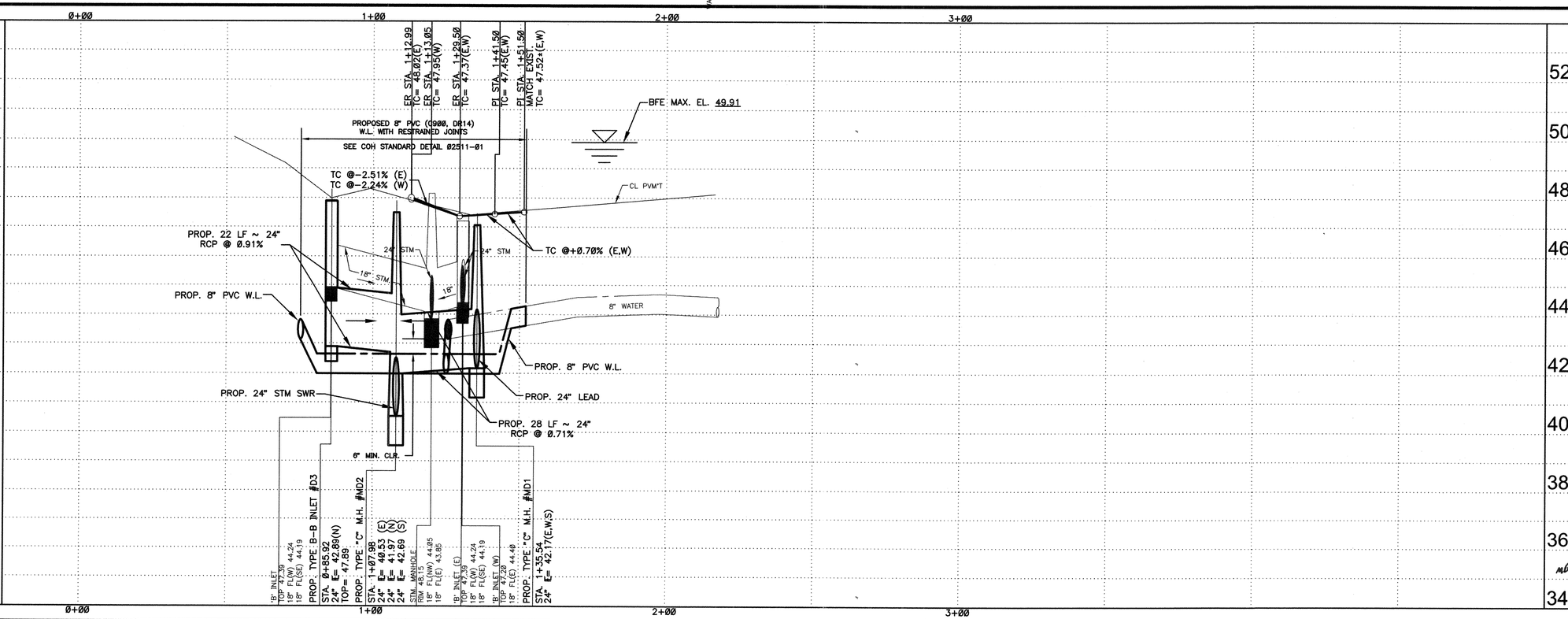
City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Linkmeadow Lane
Sta. 5+00 to End

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	
DRAWING SCALE	
VERT: 1"=2' HORZ: 1"=20'	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	
SHEET No: 61 OF 122	

PUBLIC WORKS AND ENGINEERING — REVIEWED AND FILED — 48978 — NUMBER — TEXAS





NOTES:

1. SEE SHEET 4 FOR KEYED NOTE CALLOUTS
2. SEE SHEETS 5,6, &7 FOR HORIZONTAL CONTROLS
3. FOR EXISTING UNDERGROUND UTILITIES NOTES (SEE SHEET 3)
4. ALL PAVING OFFSETS ARE SYMMETRICAL ABOUT THE BASELINE UNLESS OTHERWISE NOTED.
5. SEE SHEET 121 FOR DRIVEWAY TABLE
6. ALL ELEVATIONS SHOWN IN HOUSTORM CALCULATIONS ARE IN TSARP DATUM (1988 DATUM, 2001 ADJ.). SURVEY AND PLAN ELEVATIONS ARE IN NSRS (CORS) DATUM; EQUATION TO TIE FROM NSRS (CORS) DATUM TO TSARP DATUM IS:
TSARP EL. (ft) = NSRS EL. (ft) - 0.21

TBM'S:

TBM 12: Cut X in concrete sidewalk located at the northwest corner of Durhill Street and Iona Lane at Durhill Street Sta. 8+90.85, 21.61' left, Elev. 47.91.

PROP. CONCRETE TRANSITION (SEE DETAIL SHEET 118)

CURVE DATA

C6
Δ = 12°10'46"
R = 501.15'
Arc Length = 106.53'
Chord Bearing = S08°22'20"E
Chord Length = 106.33'
T = 53.47'
E = 2.84'

C8
Δ = 17°45'06"
R = 892.00'
Arc Length = 276.36'
Chord Bearing = S66°42'58"W
Chord Length = 275.26'
T = 139.30'
E = 10.81'

C9
Δ = 11°59'10"
R = 892.00'
Arc Length = 186.61'
Chord Bearing = S81°35'06"W
Chord Length = 186.27'
T = 93.64'
E = 4.90'

STANDARD PROFILE LEGEND

CENTER LINE OF R.O.W.
PROPERTY LINE N & E
PROPERTY LINE S & W
DITCH OR TOP OF CURB N&E
DITCH OR TOP OF CURB S&W

MK.	DESCRIPTION	DATE	DWN.	CHK.

REVISIONS

PRIVATE UTILITY LINES SHOWN
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Centerpoint Energy Power Facilities — Date: 11/3/11
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STATE OF TEXAS — JOHN D. RUDLOFF — 83386 — LICENSED PROFESSIONAL ENGINEER
10/19/11

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 — Dwn By: P. Hopkins
Date: May 2011 — Chkd By: D. Jorgensen

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

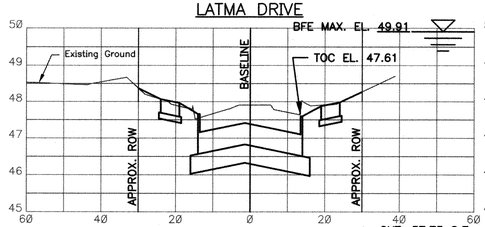
Ilona Lane
Sta. 1+00 to End

WBS NO.
N-000378-0002-4
DRAWING SCALE
VERT: 1"=2' HORZ: 1"=20'
CITY OF HOUSTON PM
MARK BOARD, P.E.

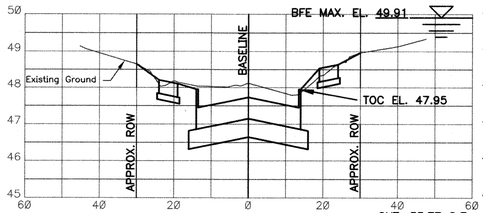
FOR CITY OF HOUSTON USE ONLY
PUBLIC WORKS AND ENGINEERING — REVIEWED AND FILED — 48978 — NUMBER — TEXAS

SHEET No: 62 OF 122

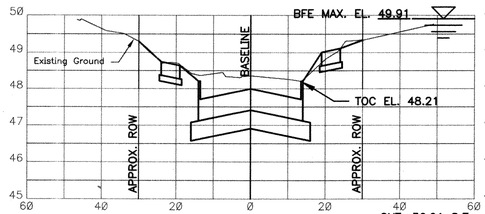
LATMA DRIVE



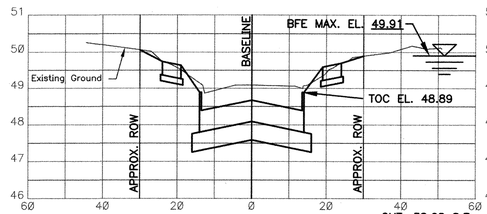
STATION 2+10.09
CUT: 37.75 S.F.
FILL: 6.68 S.F.



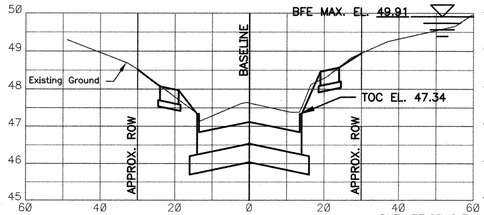
STATION 8+00
CUT: 33.77 S.F.
FILL: 7.00 S.F.



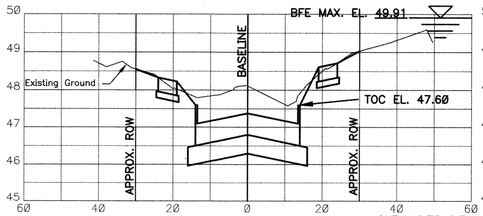
STATION 14+00
CUT: 36.91 S.F.
FILL: 7.48 S.F.



STATION 20+00
CUT: 38.68 S.F.
FILL: 7.78 S.F.



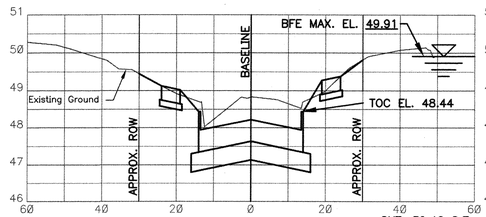
STATION 3+00
CUT: 37.80 S.F.
FILL: 8.33 S.F.



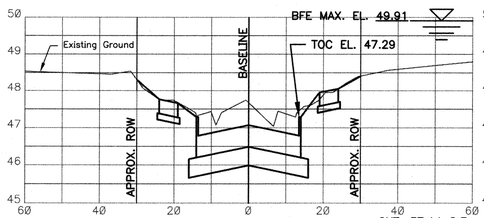
STATION 9+00
CUT: 42.70 S.F.
FILL: 8.03 S.F.



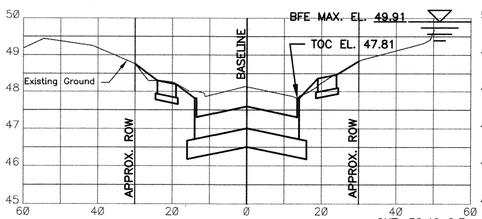
STATION 15+00
CUT: 34.93 S.F.
FILL: 7.53 S.F.



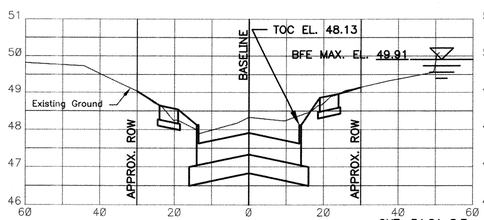
STATION 21+00
CUT: 39.46 S.F.
FILL: 7.85 S.F.



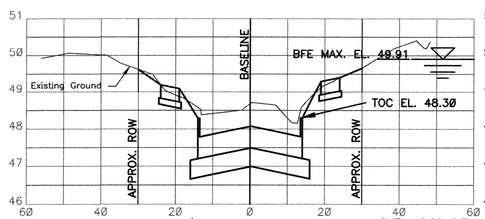
STATION 4+00
CUT: 37.14 S.F.
FILL: 7.37 S.F.



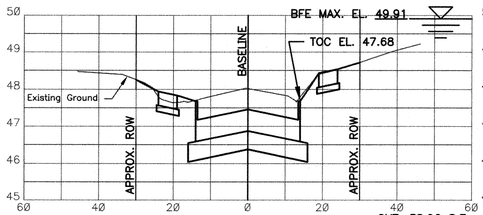
STATION 10+00
CUT: 38.42 S.F.
FILL: 7.61 S.F.



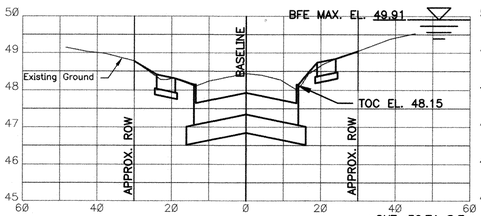
STATION 16+00
CUT: 34.81 S.F.
FILL: 7.69 S.F.



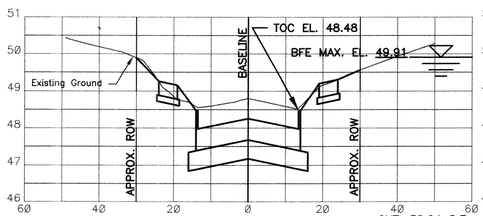
STATION 22+00
CUT: 40.82 S.F.
FILL: 8.20 S.F.



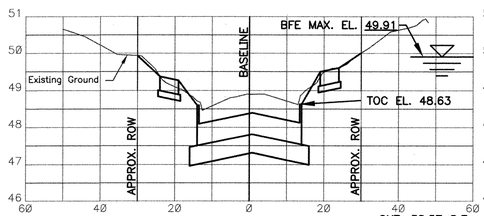
STATION 5+00
CUT: 38.96 S.F.
FILL: 7.14 S.F.



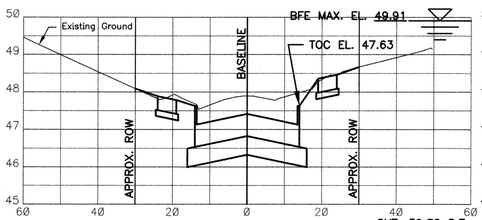
STATION 11+00
CUT: 36.71 S.F.
FILL: 6.95 S.F.



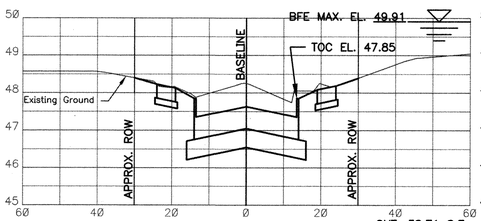
STATION 17+00
CUT: 38.84 S.F.
FILL: 7.88 S.F.



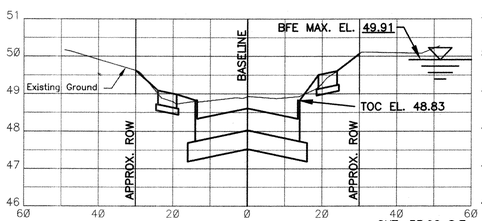
STATION 23+00
CUT: 38.57 S.F.
FILL: 7.97 S.F.



STATION 6+00
CUT: 39.06 S.F.
FILL: 7.03 S.F.



STATION 12+00
CUT: 38.71 S.F.
FILL: 6.28 S.F.



STATION 18+00
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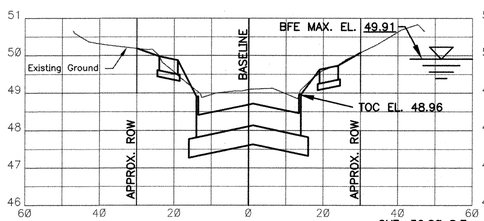
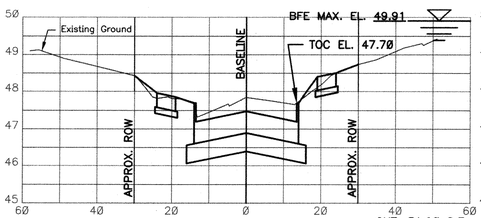
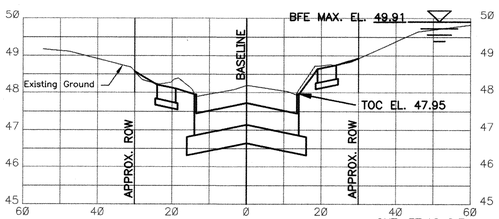
FILL: 7.62 S.F.



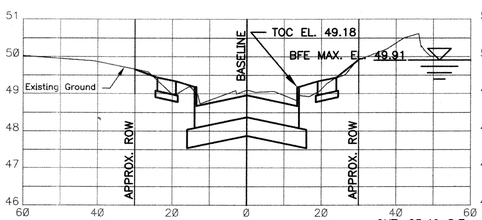
STATION 24+00
CUT: 36.80 S.F.
FILL: 8.15 S.F.



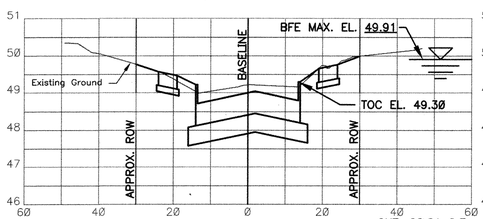
STATION 7+00
CUT: 31.90 S.F.
FILL: 7.70 S.F.



STATION 13+00
CUT: 37.18 S.F.
FILL: 7.05 S.F.



STATION 19+00
CUT: 25.49 S.F.
FILL: 7.55 S.F.



STATION 25+00
CUT: 28.81 S.F.
FILL: 6.69 S.F.

NOTE:

1. SEE SHEET 68 CUT AND FILL QUANTITIES.
2. ALL ELEVATIONS SHOWN IN HOUSTORM CALCULATIONS ARE IN TSARP DATUM (1988 DATUM, 2001 ADJ.). SURVEY AND PLAN ELEVATIONS ARE IN NSRS (CORS) DATUM; EQUATION TO TIE FROM NSRS (CORS) DATUM TO TSARP DATUM IS:
TSARP EL. (ft) = NSRS EL. (ft) – 0.21

APPROVED
FLOODPLAIN GROUP
Date: 12/7/2011 By: TDT

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Engineering Consultants
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STATE OF TEXAS
JOHN D. RUDLOFF
83386
LICENSED
PROFESSIONAL ENGINEER
10/19/11

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 | Dwn By: F. Redburn
Date: May 2011 | Chkd By: D. Jorgensen

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

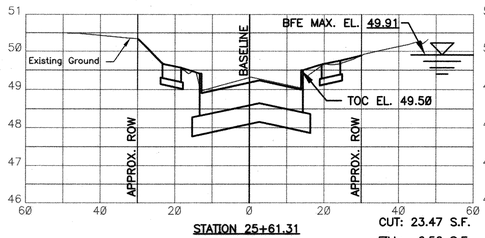
City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Cross Sections I

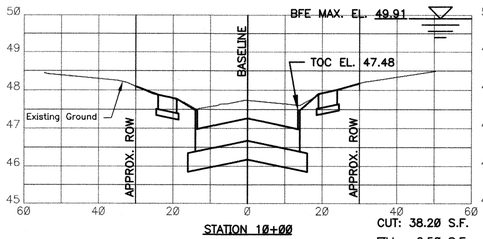
WBS NO.
N-000378-0002-4
DRAWING SCALE
VERT: NA HORZ: NA
CITY OF HOUSTON PM
MARK BOARD, P.E.

FOR CITY OF HOUSTON USE ONLY

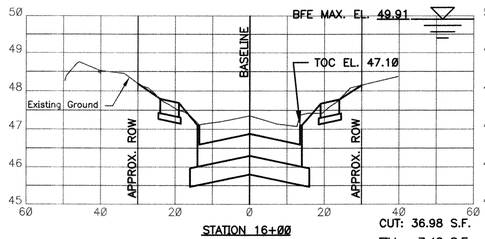
PUBLIC WORKS AND ENGINEERING
FILED
48978
LICENSE NUMBER
TEXAS



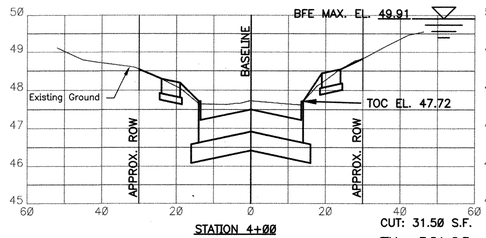
STATION 25+61.31
CUT: 23.47 S.F.
FILL: 6.56 S.F.



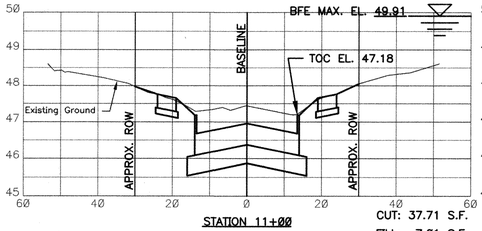
STATION 10+00
CUT: 38.20 S.F.
FILL: 6.50 S.F.



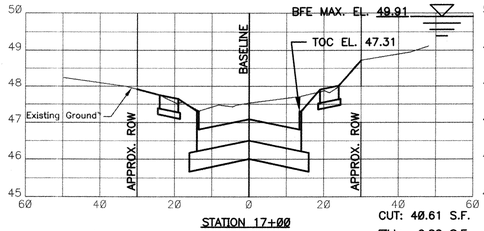
STATION 16+00
CUT: 36.98 S.F.
FILL: 7.48 S.F.



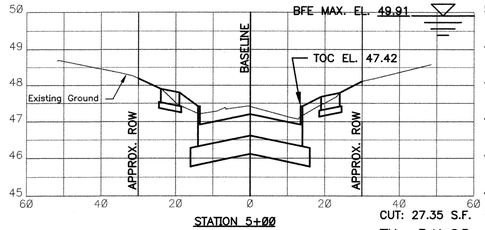
STATION 4+00
CUT: 31.50 S.F.
FILL: 7.54 S.F.



STATION 11+00
CUT: 37.71 S.F.
FILL: 7.01 S.F.

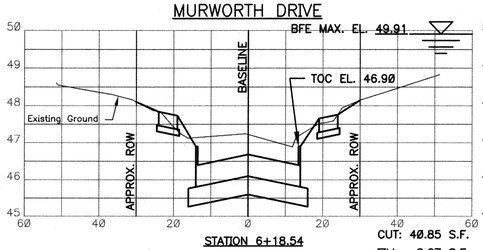


STATION 17+00
CUT: 40.61 S.F.
FILL: 6.82 S.F.

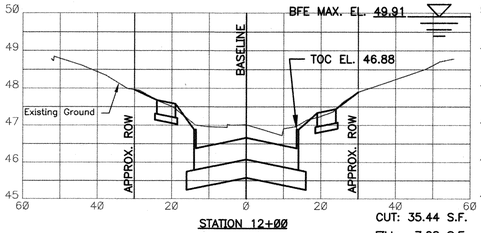


STATION 5+00
CUT: 27.35 S.F.
FILL: 7.41 S.F.

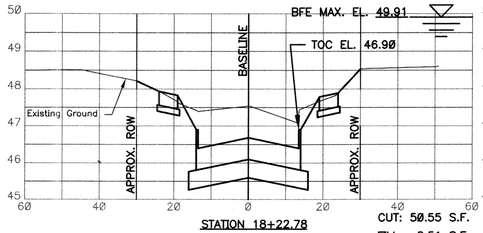
MURWORTH DRIVE



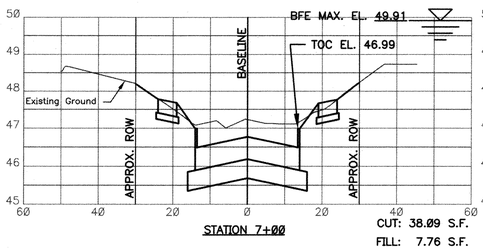
STATION 6+18.54
CUT: 40.85 S.F.
FILL: 8.27 S.F.



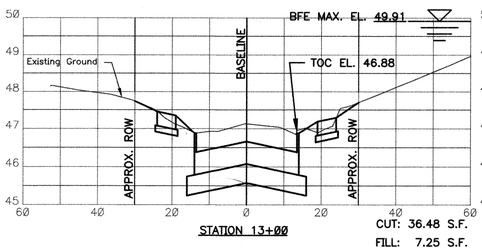
STATION 12+00
CUT: 35.44 S.F.
FILL: 7.28 S.F.



STATION 18+22.78
CUT: 50.55 S.F.
FILL: 8.51 S.F.

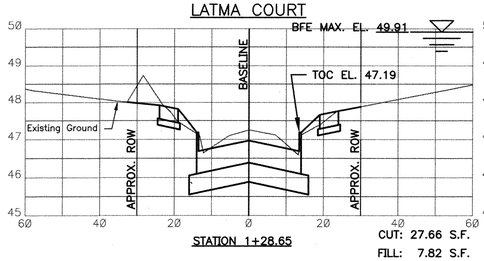


STATION 7+00
CUT: 38.09 S.F.
FILL: 7.76 S.F.

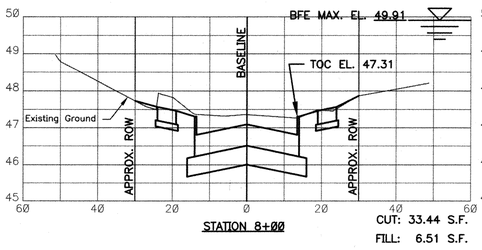


STATION 13+00
CUT: 36.48 S.F.
FILL: 7.25 S.F.

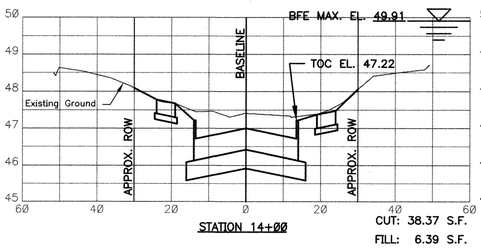
LATMA COURT



STATION 1+28.65
CUT: 27.66 S.F.
FILL: 7.82 S.F.

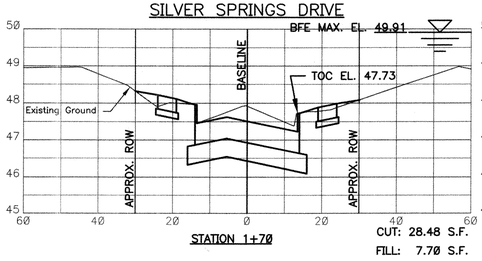


STATION 8+00
CUT: 33.44 S.F.
FILL: 6.51 S.F.

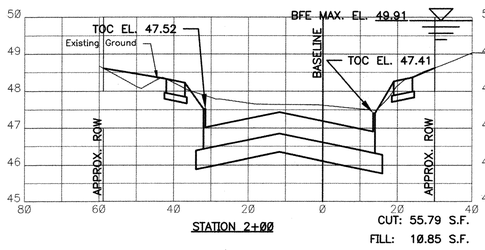


STATION 14+00
CUT: 38.37 S.F.
FILL: 6.39 S.F.

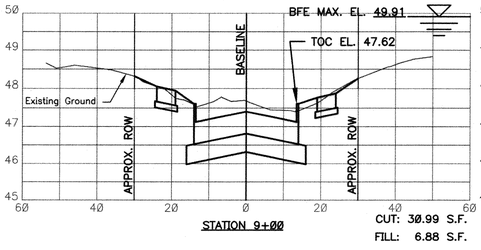
SILVER SPRINGS DRIVE



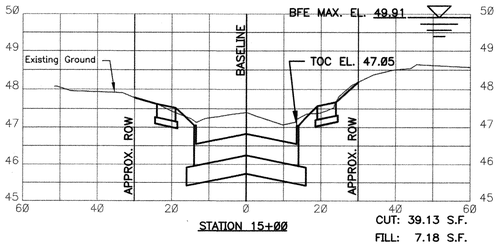
STATION 1+70
CUT: 28.48 S.F.
FILL: 7.70 S.F.



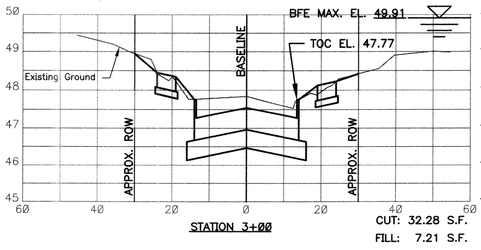
STATION 2+00
CUT: 55.79 S.F.
FILL: 10.85 S.F.



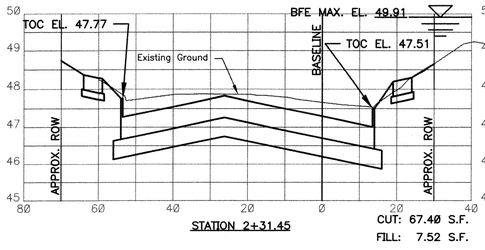
STATION 9+00
CUT: 30.99 S.F.
FILL: 6.88 S.F.



STATION 15+00
CUT: 39.13 S.F.
FILL: 7.18 S.F.



STATION 3+00
CUT: 32.28 S.F.
FILL: 7.21 S.F.



STATION 2+31.45
CUT: 67.40 S.F.
FILL: 7.52 S.F.

NOTE:

1. SEE SHEET 68 CUT AND FILL QUANTITIES.
2. ALL ELEVATIONS SHOWN IN HOUSTORM CALCULATIONS ARE IN TSARP DATUM (1988 DATUM, 2001 ADJ.). SURVEY AND PLAN ELEVATIONS ARE IN NSRS (CORS) DATUM; EQUATION TO TIE FROM NSRS (CORS) DATUM TO TSARP DATUM IS:
   TSARP EL. (ft) = NSRS EL. (ft) – 0.21

APPROVED
FLOODPLAIN GROUP
Date: 12/7/2011 By: TJT

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HDR Engineering Inc. Texas Reg. No. F-754

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Houston, Texas 77027
(713) 622-9264
Fax (713) 622-9265

STATE OF TEXAS
JOHN D. RUDLOFF
83386
LICENSED
PROFESSIONAL ENGINEER
10/19/11

SURVEYED BY: Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 | Dwn By: F. Redburn
Date: May 2011 | Chkd By: D. Jorgensen

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

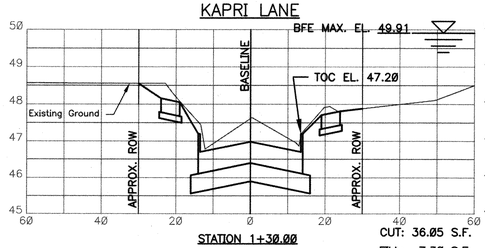
City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Cross Sections II

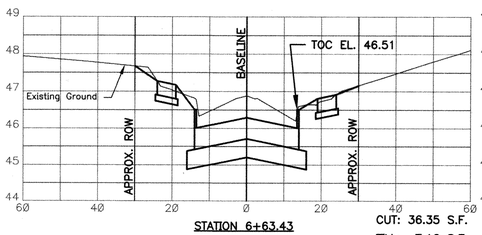
WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	PUBLIC WORKS AND ENGINEERING — FILED — 48978 — NUMBER — TEXAS
DRAWING SCALE	
VERT: NA HORZ: NA	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	

SHEET No: 64 OF 122

KAPRI LANE



STATION 1+30.00
CUT: 36.05 S.F.
FILL: 7.30 S.F.



STATION 6+63.43
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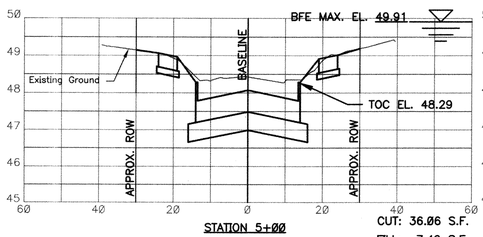
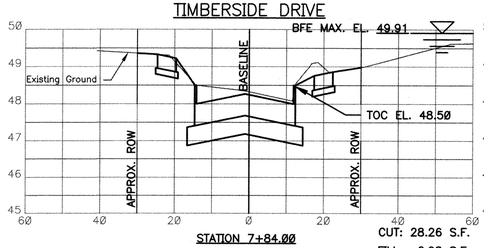
FILL: 7.16 S.F.

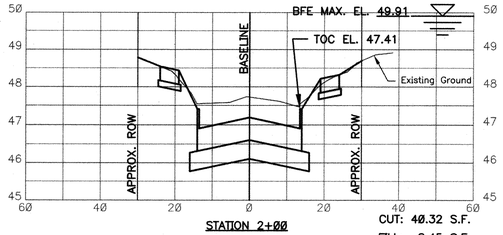


STATION 5+00
CUT: 36.06 S.F.
FILL: 7.49 S.F.

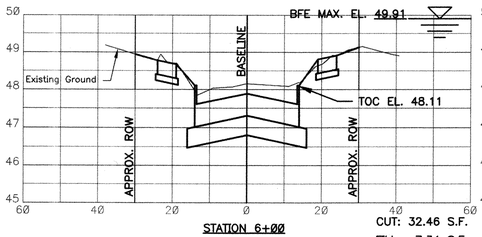
TIMBERSIDE DRIVE



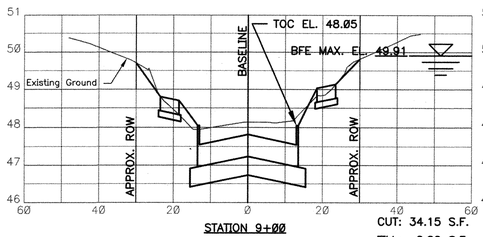
STATION 7+84.00
CUT: 28.26 S.F.
FILL: 6.98 S.F.



STATION 2+00
CUT: 40.32 S.F.
FILL: 8.45 S.F.

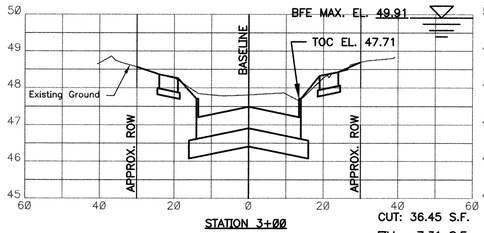


STATION 6+00
CUT: 32.46 S.F.
FILL: 7.34 S.F.

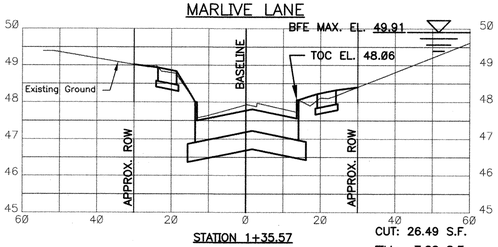


STATION 9+00
CUT: 34.15 S.F.
FILL: 8.82 S.F.

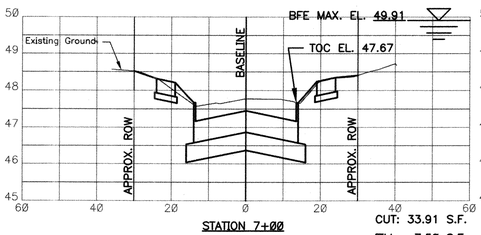
MARLIVE LANE



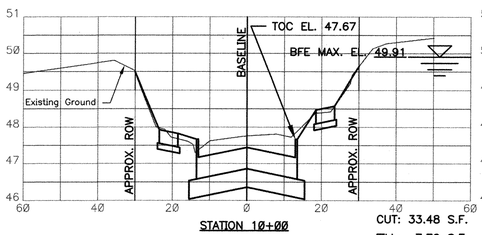
STATION 3+00
CUT: 36.45 S.F.
FILL: 7.31 S.F.



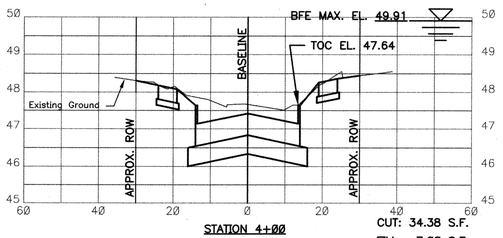
STATION 1+35.57
CUT: 26.49 S.F.
FILL: 7.88 S.F.



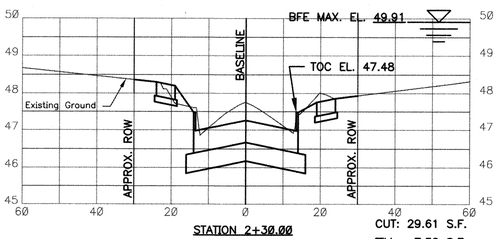
STATION 7+00
CUT: 33.91 S.F.
FILL: 7.50 S.F.



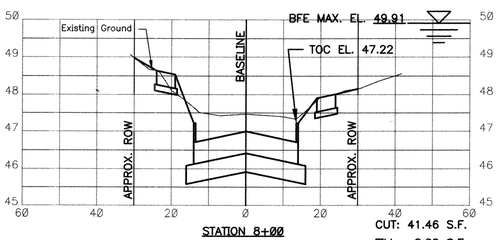
STATION 10+00
CUT: 33.48 S.F.
FILL: 7.72 S.F.



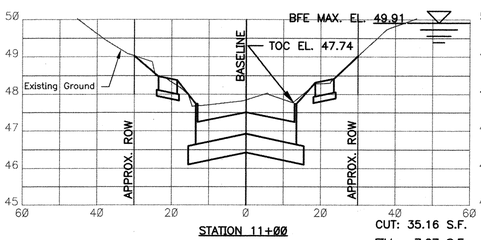
STATION 4+00
CUT: 34.38 S.F.
FILL: 7.00 S.F.



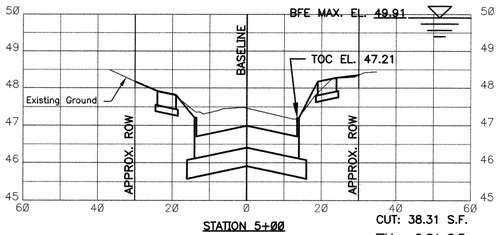
STATION 2+30.00
CUT: 29.61 S.F.
FILL: 7.38 S.F.



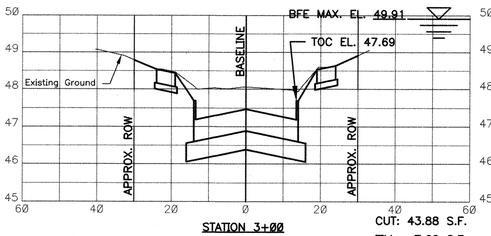
STATION 8+00
CUT: 41.46 S.F.
FILL: 8.88 S.F.



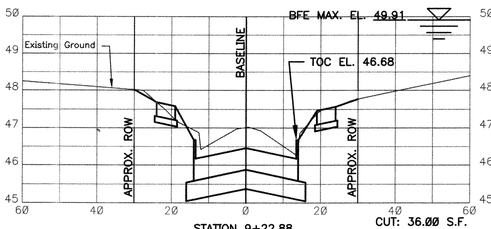
STATION 11+00
CUT: 35.16 S.F.
FILL: 7.27 S.F.



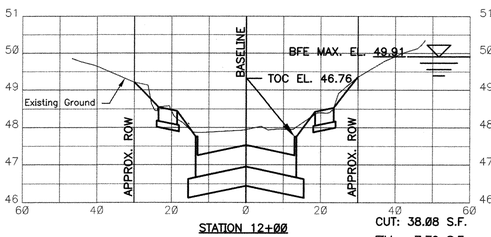
STATION 5+00
CUT: 38.31 S.F.
FILL: 8.04 S.F.



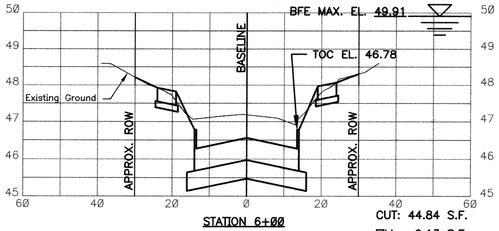
STATION 3+00
CUT: 43.88 S.F.
FILL: 7.62 S.F.



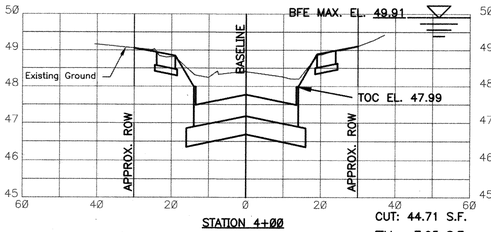
STATION 9+22.88
CUT: 36.00 S.F.
FILL: 8.19 S.F.



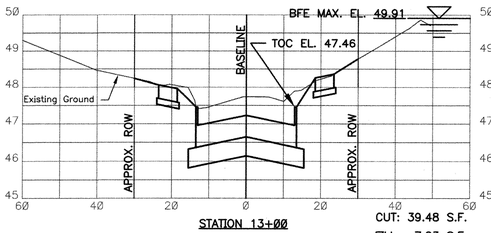
STATION 12+00
CUT: 38.08 S.F.
FILL: 7.79 S.F.



STATION 6+00
CUT: 44.84 S.F.
FILL: 9.13 S.F.



STATION 4+00
CUT: 44.71 S.F.
FILL: 7.95 S.F.



STATION 13+00
CUT: 39.48 S.F.
FILL: 7.23 S.F.

NOTE:

1. SEE SHEET 68 CUT AND FILL QUANTITIES.
2. ALL ELEVATIONS SHOWN IN HOUSTORM CALCULATIONS ARE IN TSARP DATUM (1988 DATUM, 2001 ADJ.). SURVEY AND PLAN ELEVATIONS ARE IN NSRS (CORS) DATUM; EQUATION TO TIE FROM NSRS (CORS) DATUM TO TSARP DATUM IS: TSARP EL. (ft) = NSRS EL. (ft) – 0.21

APPROVED
FLOODPLAIN GROUP
Date: 12/7/2011 By: JDT

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Suite 1000
Houston, Texas 77027
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Fax (713) 622-9265

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

STATE OF TEXAS
JOHN D. RUDLOFF
83386
LICENSED
PROFESSIONAL ENGINEER
10/14/11

Job No.: 09-051	Dwn By: F. Redburn
Date: May 2011	Chkd By: D. Jorgensen

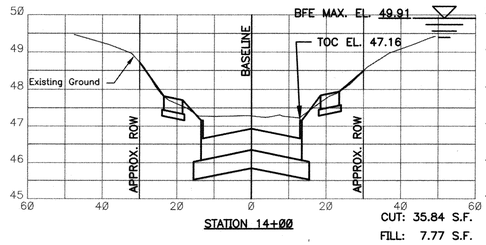
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

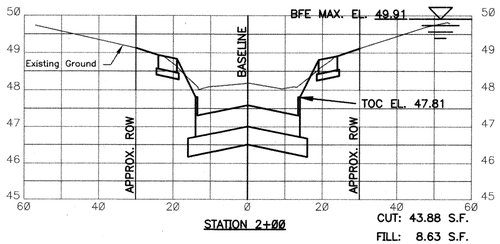
Cross Sections III

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	
DRAWING SCALE	
VERT: NA HORZ: NA	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	

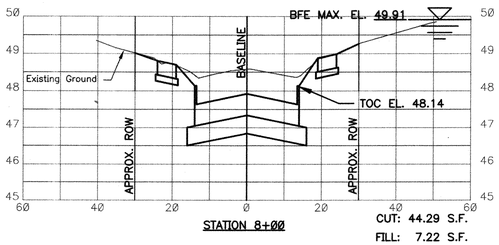
PUBLIC WORKS AND ENGINEERING
ACCEPTED AND FILED
48978
ID NUMBER
TEXAS



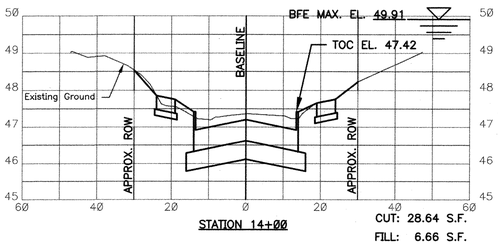
STATION 14+ØØ
CUT: 35.84 S.F.
FILL: 7.77 S.F.



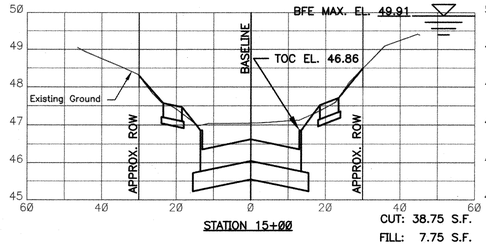
STATION 2+ØØ
CUT: 43.88 S.F.
FILL: 8.63 S.F.



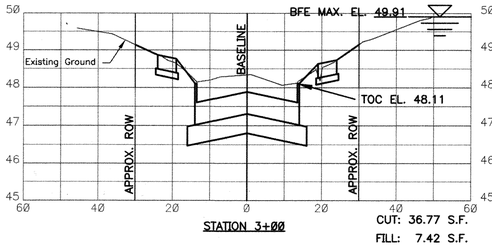
STATION 8+ØØ
CUT: 44.29 S.F.
FILL: 7.22 S.F.



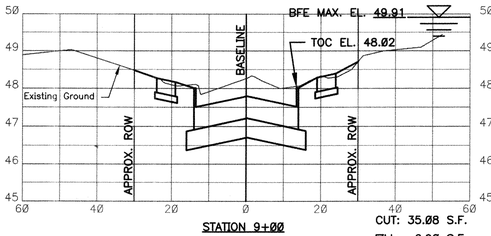
STATION 14+ØØ
CUT: 28.64 S.F.
FILL: 6.66 S.F.



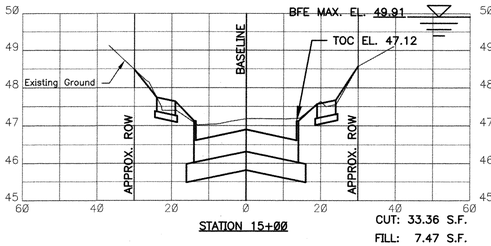
STATION 15+ØØ
CUT: 38.75 S.F.
FILL: 7.75 S.F.



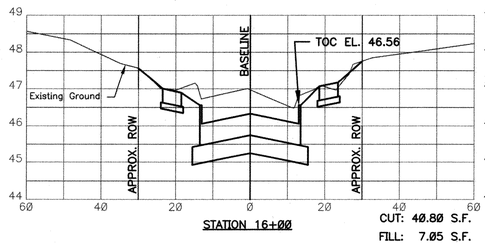
STATION 3+ØØ
CUT: 36.77 S.F.
FILL: 7.42 S.F.



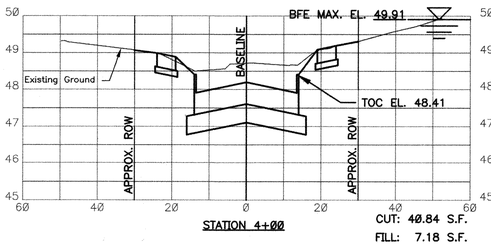
STATION 9+ØØ
CUT: 35.08 S.F.
FILL: 6.90 S.F.



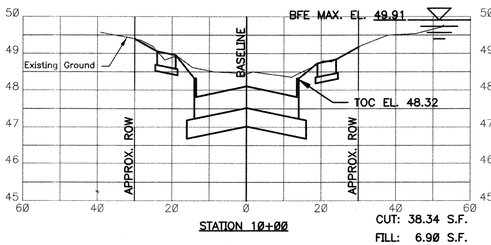
STATION 15+ØØ
CUT: 33.36 S.F.
FILL: 7.47 S.F.



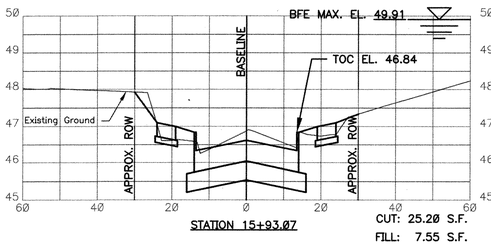
STATION 16+ØØ
CUT: 40.8Ø S.F.
FILL: 7.Ø5 S.F.



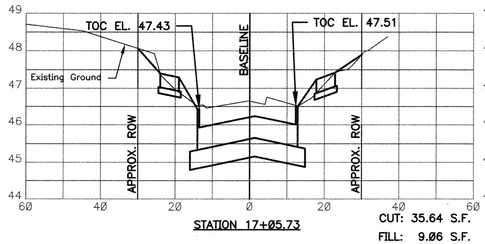
STATION 4+ØØ
CUT: 40.84 S.F.
FILL: 7.18 S.F.



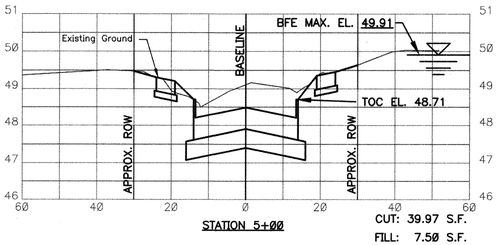
STATION 1Ø+ØØ
CUT: 38.34 S.F.
FILL: 6.9Ø S.F.



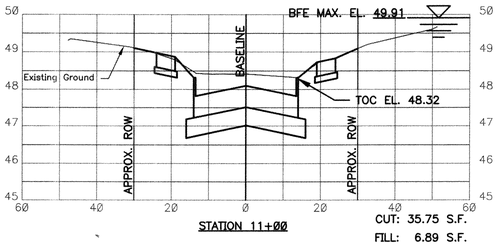
STATION 15+93.Ø7
CUT: 25.2Ø S.F.
FILL: 7.55 S.F.



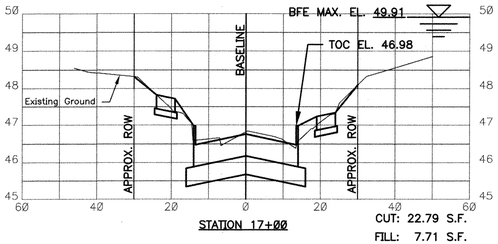
STATION 17+Ø5.73
CUT: 35.64 S.F.
FILL: 9.Ø6 S.F.



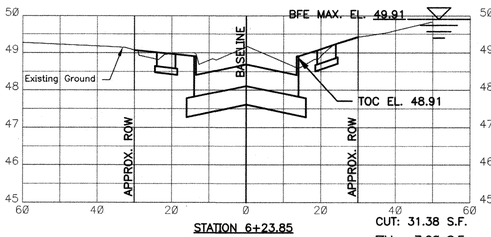
STATION 5+ØØ
CUT: 39.97 S.F.
FILL: 7.5Ø S.F.



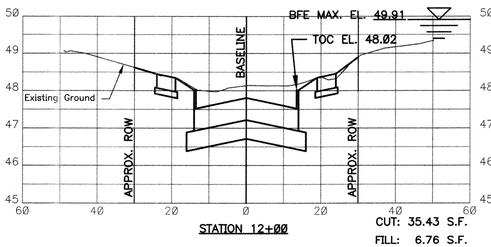
STATION 11+ØØ
CUT: 35.75 S.F.
FILL: 6.89 S.F.



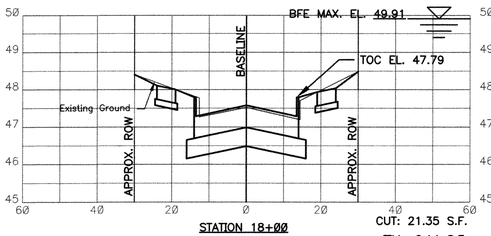
STATION 17+ØØ
CUT: 22.79 S.F.
FILL: 7.71 S.F.



STATION 6+23.85
CUT: 31.38 S.F.
FILL: 7.2Ø S.F.

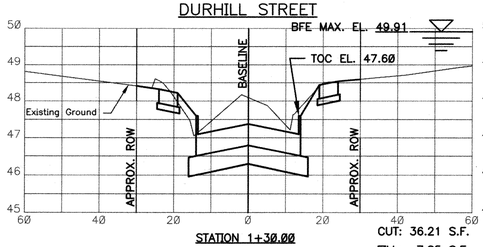


STATION 12+ØØ
CUT: 35.43 S.F.
FILL: 6.76 S.F.

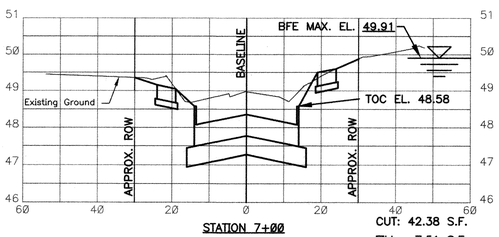


STATION 18+ØØ
CUT: 21.35 S.F.
FILL: 6.14 S.F.

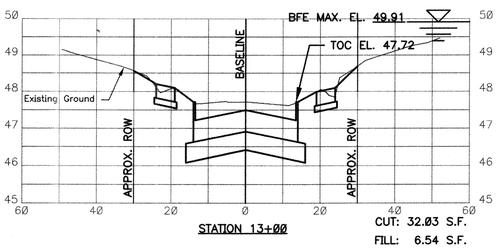
DURHILL STREET



STATION 1+3Ø.ØØ
CUT: 36.21 S.F.
FILL: 7.85 S.F.



STATION 7+ØØ
CUT: 42.38 S.F.
FILL: 7.51 S.F.



STATION 13+ØØ
CUT: 32.Ø3 S.F.
FILL: 6.54 S.F.

NOTE:

1. SEE SHEET 68 CUT AND FILL QUANTITIES.
2. ALL ELEVATIONS SHOWN IN HOUSTORM CALCULATIONS ARE IN TSARP DATUM (1988 DATUM, 2ØØ1 ADJ.). SURVEY AND PLAN ELEVATIONS ARE IN NSRS (CORS) DATUM; EQUATION TO TIE FROM NSRS (CORS) DATUM TO TSARP DATUM IS:
   TSARP EL. (ft) = NSRS EL. (ft) – Ø.21

APPROVED
FLOODPLAIN GROUP
Date: 12/7/2011 By: JDT

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Houston, Texas 77027

(713) 622-9264
Fax (713) 622-9265

STATE OF TEXAS
JOHN D. RUDLOFF
83386
LICENSED
PROFESSIONAL ENGINEER
10/19/11

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 | Dwn By: F. Redburn
Date: May 2011 | Chkd By: D. Jorgensen

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

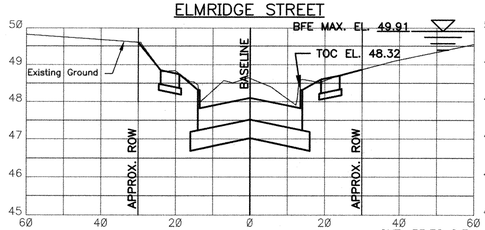
Cross Sections IV

WBS NO.
N-000378-0002-4
DRAWING SCALE
VERT: NA HORZ: NA
CITY OF HOUSTON PM
MARK BOARD, P.E.

FOR CITY OF HOUSTON USE ONLY
PUBLIC WORKS AND ENGINEERING
REVIEWED AND FILED
48978
NUMBER

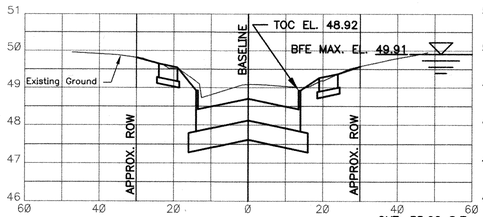
SHEET No: 66 OF 122

ELMRIDGE STREET



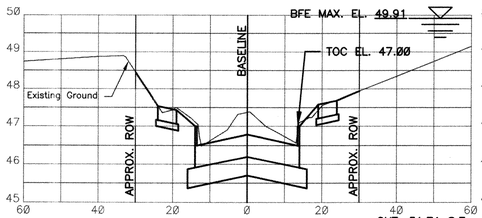
STATION 1+30.00

CUT: 35.38 S.F.
FILL: 6.49 S.F.



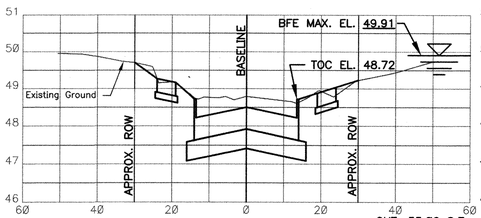
STATION 7+00

CUT: 35.92 S.F.
FILL: 6.96 S.F.



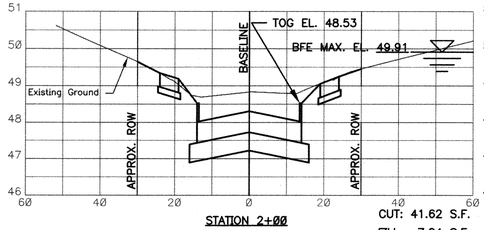
STATION 12+81.12

CUT: 31.71 S.F.
FILL: 7.09 S.F.



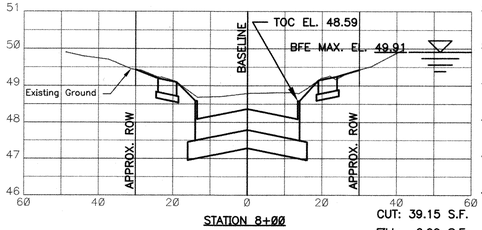
STATION 5+00

CUT: 33.06 S.F.
FILL: 6.95 S.F.



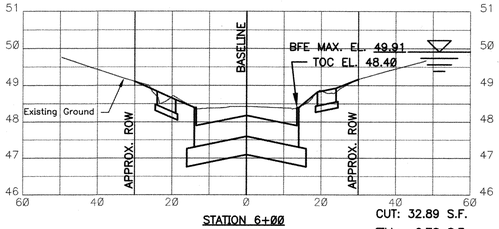
STATION 2+00

CUT: 41.62 S.F.
FILL: 7.24 S.F.



STATION 8+00

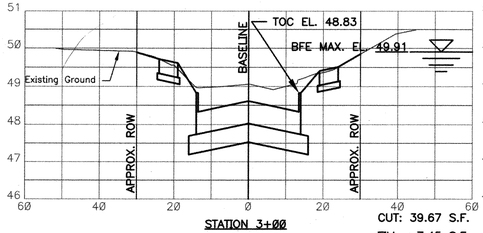
CUT: 39.15 S.F.
FILL: 6.99 S.F.



STATION 6+00

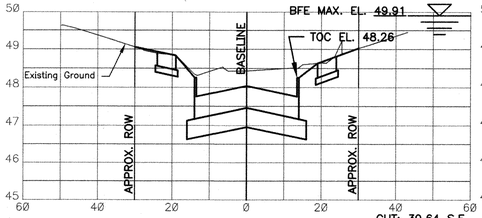
CUT: 32.89 S.F.
FILL: 6.78 S.F.

CLOVERDALE STREET



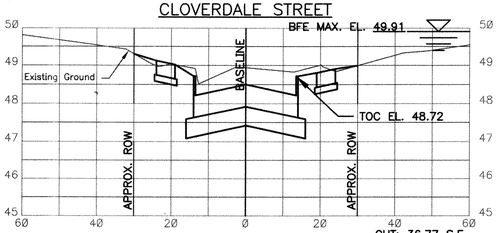
STATION 3+00

CUT: 39.67 S.F.
FILL: 7.45 S.F.



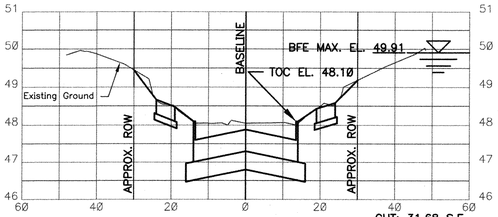
STATION 9+00

CUT: 39.64 S.F.
FILL: 6.95 S.F.



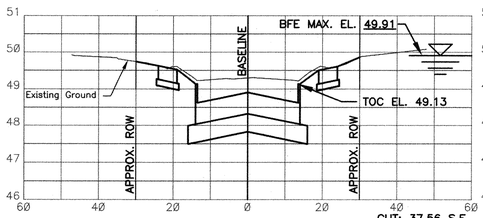
STATION 1+30.00

CUT: 36.77 S.F.
FILL: 6.82 S.F.



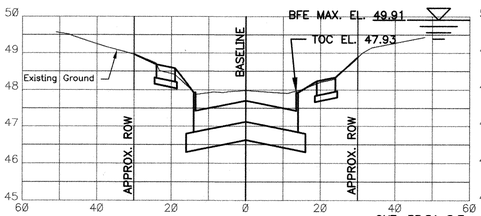
STATION 7+00

CUT: 31.68 S.F.
FILL: 6.52 S.F.



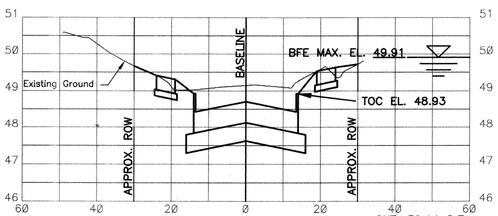
STATION 4+00

CUT: 37.56 S.F.
FILL: 6.66 S.F.



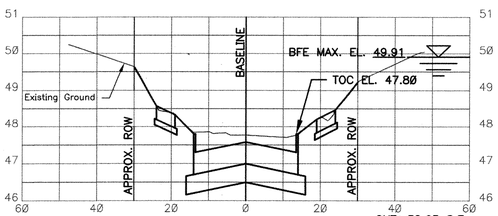
STATION 10+00

CUT: 33.51 S.F.
FILL: 7.10 S.F.



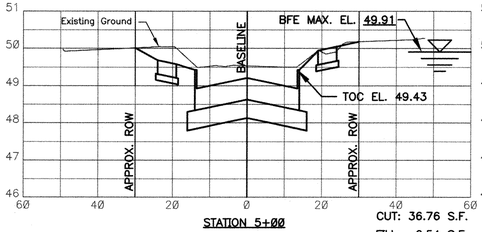
STATION 2+00

CUT: 39.14 S.F.
FILL: 8.05 S.F.



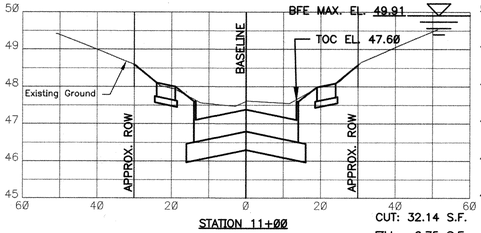
STATION 8+00

CUT: 32.63 S.F.
FILL: 6.76 S.F.



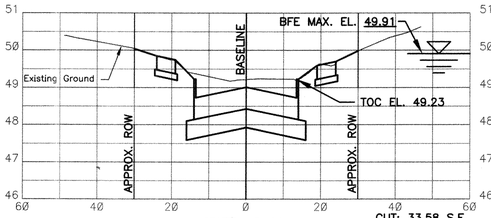
STATION 5+00

CUT: 36.76 S.F.
FILL: 6.54 S.F.



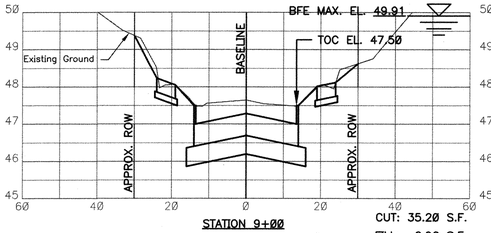
STATION 11+00

CUT: 32.14 S.F.
FILL: 6.75 S.F.



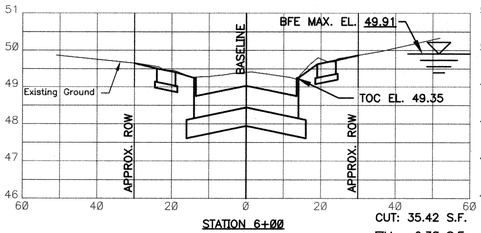
STATION 3+00

CUT: 33.58 S.F.
FILL: 6.81 S.F.



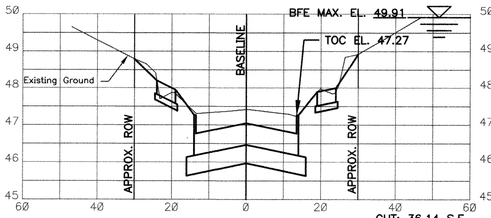
STATION 9+00

CUT: 35.20 S.F.
FILL: 6.96 S.F.



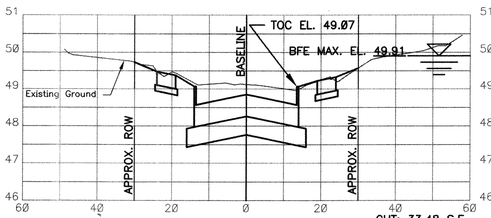
STATION 6+00

CUT: 35.42 S.F.
FILL: 6.30 S.F.



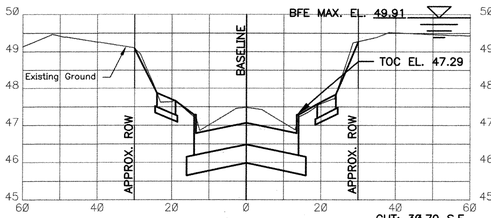
STATION 12+00

CUT: 36.14 S.F.
FILL: 7.38 S.F.



STATION 4+00

CUT: 33.48 S.F.
FILL: 6.73 S.F.



STATION 9+69.37

CUT: 30.79 S.F.
FILL: 6.54 S.F.

NOTE:

1. SEE SHEET 68 CUT AND FILL QUANTITIES.
2. ALL ELEVATIONS SHOWN IN HOUSTORM CALCULATIONS ARE IN TSARP DATUM (1988 DATUM, 2001 ADJ.). SURVEY AND PLAN ELEVATIONS ARE IN NSRS (CORS) DATUM; EQUATION TO TIE FROM NSRS (CORS) DATUM TO TSARP DATUM IS:
TSARP EL. (ft) = NSRS EL. (ft) – 0.21

APPROVED
FLOODPLAIN GROUP
Date: 12/7/2011 By: TDT

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Fax (713) 622-9265

STATE OF TEXAS
JOHN D. RUDLOFF
83386
LICENSED
PROFESSIONAL ENGINEER
10/19/11

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 | Dwn By: F. Redburn
Date: May 2011 | Chkd By: D. Jorgensen

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

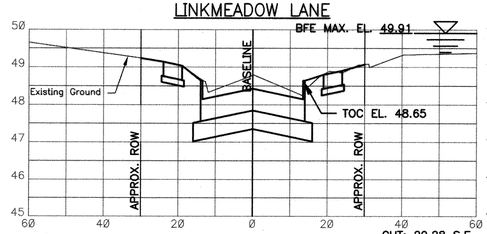
Cross Sections V

WBS NO.
N-000378-0002-4
DRAWING SCALE
VERT: NA HORZ: NA
CITY OF HOUSTON PM
MARK BOARD, P.E.

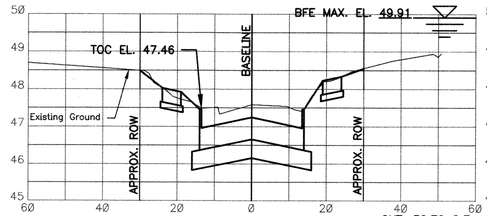
FOR CITY OF HOUSTON USE ONLY

PUBLIC WORKS AND ENGINEERING
ENGINEERING FILE
48978
LICENSE NUMBER
TEXAS

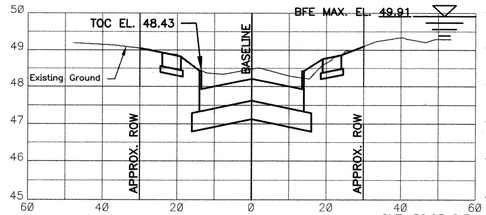
LINKMEADOW LANE



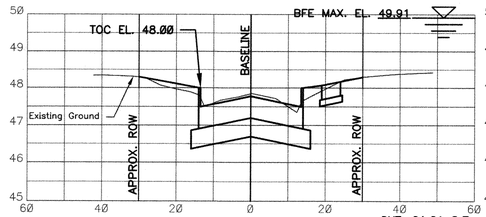
STATION 1+29.53
CUT: 29.28 S.F.
FILL: 6.41 S.F.



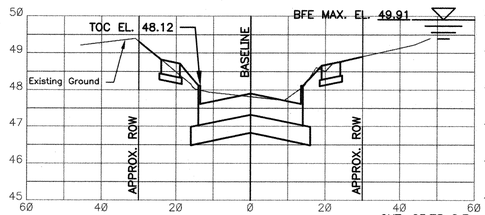
STATION 7+00
CUT: 32.72 S.F.
FILL: 5.25 S.F.



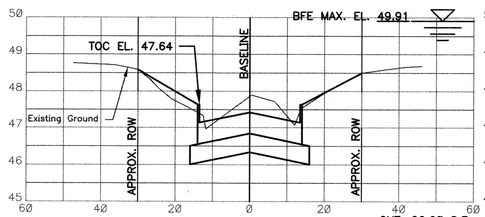
STATION 2+00
CUT: 32.95 S.F.
FILL: 5.60 S.F.



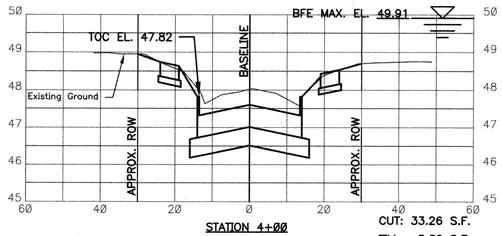
STATION 8+00
CUT: 21.81 S.F.
FILL: 7.86 S.F.



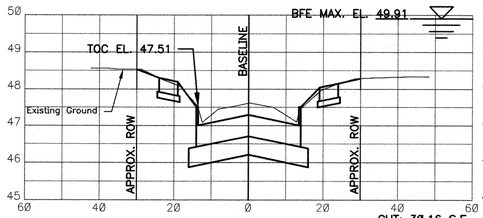
STATION 3+00
CUT: 23.75 S.F.
FILL: 5.72 S.F.



STATION 9+00
CUT: 26.60 S.F.
FILL: 7.41 S.F.

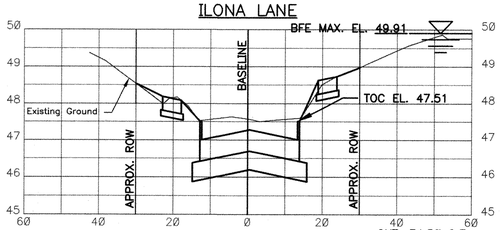


STATION 4+00
CUT: 33.26 S.F.
FILL: 5.06 S.F.

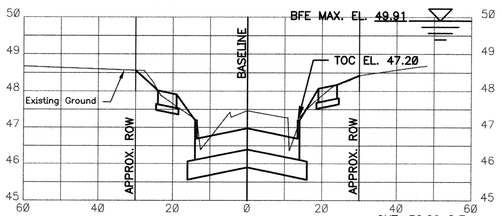


STATION 5+00
CUT: 30.16 S.F.
FILL: 6.25 S.F.

ILONA LANE



STATION 1+49.65
CUT: 34.50 S.F.
FILL: 8.72 S.F.



STATION 6+00
CUT: 32.29 S.F.
FILL: 8.33 S.F.

PROJECT AREA CUT/FILL QUANTITIES		
BASE BID	CUT (C.Y.)	FILL (C.Y.)
LATMA DR.	3,175	653
MURWORTH DR.	1,682	317
SILVER SPRINGS LN.	473	114
LATMA COURT	182	35
KAPRI LN.	756	155
MARLIVE LN.	1,073	228
TIMBERSIDE DR.	1,240	264
DURHILL ST.	2,157	447
ELMRIDGE ST.	1,567	295
CLOVERDALE ST.	1,052	215
LINKMEADOW LN.	836	182
ILONA LN.	26	7
8 1/2" (AVG.) THICK ASPHALT & BASE REMOVAL	-8,100	---
BASE BID TOTALS	6,119 C.Y.	2,912 C.Y.

NOTE:

THE ABOVE QUANTITIES RESULT IN A NET REMOVAL OF PAVEMENT AND EARTH MATERIALS, (CUT) FROM FLOODPLAIN ZONE AE AND ZONE X OF APPROXIMATELY 11,307 C.Y. CONTRACTOR IS TO HAUL CUT OFF SITE AND OUT OF THE FLOODPLAIN. CALL COH FMO @ 713-535-7823 FOR DISPOSAL OR FLOODPLAIN INFO. THIS APPLIES TO UTILITY TRENCH EXCAVATION WHICH HAS NOT BEEN QUANTIFIED AS IT IS AN INCIDENTAL COST TO UTILITY INSTALLATION.

NOTE:

1. ALL ELEVATIONS SHOWN IN HOUSTORM CALCULATIONS ARE IN TSARP DATUM (1988 DATUM, 2001 ADJ.). SURVEY AND PLAN ELEVATIONS ARE IN NSRS (CORS) DATUM; EQUATION TO TIE FROM NSRS (CORS) DATUM TO TSARP DATUM IS: TSARP EL. (ft) = NSRS EL. (ft) - 0.21

APPROVED
FLOODPLAIN GROUP
Date: 12/7/11 By: JDT

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SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

STATE OF TEXAS
JOHN D. RUDLOFF
83386
LICENSED
PROFESSIONAL ENGINEER
10/24/11

Job No.: 09-051 | Dwn By: F. Redburn
Date: May 2011 | Chkd By: D. Jorgensen

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Cross Sections VI

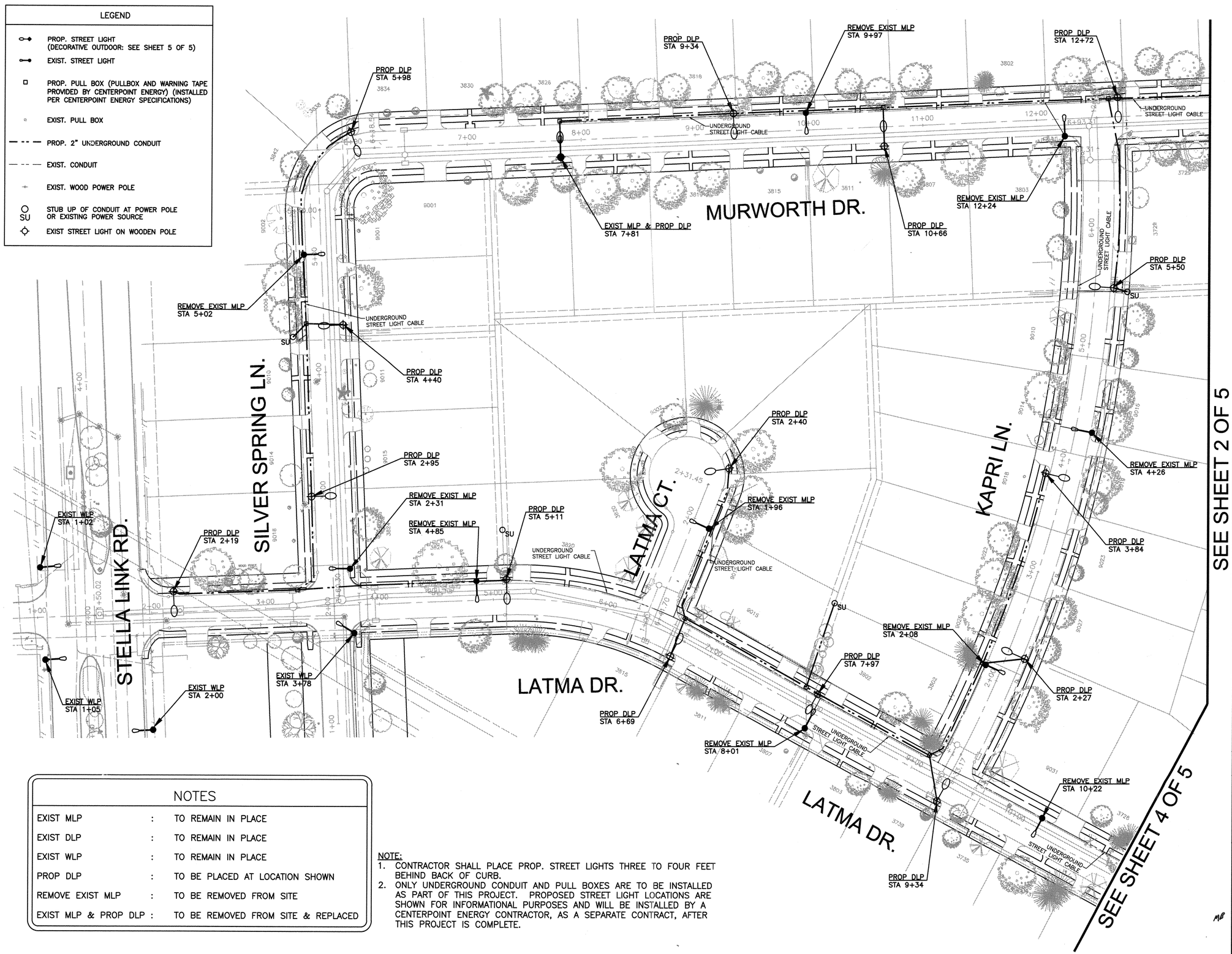
WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	
DRAWING SCALE	
VERT: NA HORZ: NA	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	
SHEET No: 68 OF 122	

PUBLIC WORKS AND ENGINEERING
REVIEWED
48978
NUMBER
TEXAS

MB

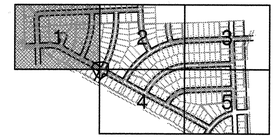
LEGEND

- PROP. STREET LIGHT (DECORATIVE OUTDOOR: SEE SHEET 5 OF 5)
- EXIST. STREET LIGHT
- PROP. PULL BOX (PULLBOX AND WARNING TAPE PROVIDED BY CENTERPOINT ENERGY) (INSTALLED PER CENTERPOINT ENERGY SPECIFICATIONS)
- EXIST. PULL BOX
- PROP. 2" UNDERGROUND CONDUIT
- EXIST. CONDUIT
- EXIST. WOOD POWER POLE
- STUB UP OF CONDUIT AT POWER POLE OR EXISTING POWER SOURCE (SU)
- EXIST STREET LIGHT ON WOODEN POLE



40' 0 40' 80'

SCALE: 1" = 40'



KEY PLAN

NOTES

EXIST MLP	:	TO REMAIN IN PLACE
EXIST DLP	:	TO REMAIN IN PLACE
EXIST WLP	:	TO REMAIN IN PLACE
PROP DLP	:	TO BE PLACED AT LOCATION SHOWN
REMOVE EXIST MLP	:	TO BE REMOVED FROM SITE
EXIST MLP & PROP DLP	:	TO BE REMOVED FROM SITE & REPLACED

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MK.	DESCRIPTION	DATE	DWN.	CHK.

REVISIONS

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Texas Reg. No. F-4575

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WWW.IAHOUSTON.COM

RAHIM TAZEHZADEH 88923 LICENSED PROFESSIONAL ENGINEER 10/31/11

SURVEYED BY: Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051	Dwn By: BD/DS
Date: September 2011	Chkd By: V. Jacob

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

STREET LIGHTING PLAN
SHEET 1 OF 5

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	PUBLIC WORKS AND ENGINEERING RECEIVED AND FILED 48978
DRAWING SCALE	
1" = 40'	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	
SHEET No: 69 OF 122	

SEE SHEET 3 OF 5

SEE SHEET 1 OF 5

SEE SHEET 4 OF 5

SEE SHEET 4 OF 5

SEE SHEET 3 OF 5

MURWORTH DR.

LINKMEADOW LN.

MARLIVE LN.

DURHILL ST.

ILONA LN.

ELMRIDGE ST.

EXIST MLP & PROP DLP STA 14+06

REMOVE EXIST MLP STA 18+21

UNDERGROUND STREET LIGHT CABLE

EXIST MLP & PROP DLP STA 15+83

PROP DLP STA 17+52

PROP DLP STA 6+12

UNDERGROUND STREET LIGHT CABLE

PROP DLP STA 7+93

SU

PROP DLP STA 4+53

REMOVE EXIST MLP STA 3+82

REMOVE EXIST MLP STA 6+76

PROP DLP STA 6+20

PROP DLP STA 4+76

REMOVE EXIST MLP STA 4+32

PROP DLP STA 3+48

SU

UNDERGROUND STREET LIGHT CABLE

EXIST MLP STA 3+87

PROP DLP STA 10+15

END PROJECT LIMIT

PROP DLP STA 6+20

REMOVE EXIST MLP STA 6+33

PROP DLP STA 2+45

SU

UNDERGROUND STREET LIGHT CABLE

REMOVE EXIST MLP STA 8+69

PROP DLP STA 8+21

PROP DLP STA 7+08

REMOVE EXIST MLP STA 7+03

PROP DLP STA 2+90

UNDERGROUND STREET LIGHT CABLE

PROP DLP STA 4+32

REMOVE EXIST MLP STA 3+53

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LEGEND

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- EXIST. STREET LIGHT
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- EXIST. PULL BOX
- PROP. 2" UNDERGROUND CONDUIT
- EXIST. CONDUIT
- EXIST. WOOD POWER POLE
- SU — STUB UP OF CONDUIT AT POWER POLE OR EXISTING POWER SOURCE
- EXIST STREET LIGHT ON WOODEN POLE

N

40' 0 40' 80'

SCALE: 1" = 40'

KEY PLAN

MK.	DESCRIPTION	DATE	DWN.	CHK.

REVISIONS

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STATE OF TEXAS — VINCENT N. JACOB — 98325 — LICENSED PROFESSIONAL ENGINEER — 10/31/11

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WWW.IAHOUSTON.COM

STATE OF TEXAS — RAHIM TAZEHZADEH — 88923 — LICENSED PROFESSIONAL ENGINEER — 10/21/11

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051	Dwn By: BD/DS
Date: September 2011	Chkd By: V. Jacob

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

STREET LIGHTING PLAN
SHEET 2 OF 5

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	
DRAWING SCALE	
1" = 40'	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	
SHEET No: 70 OF 122	

PUBLIC WORKS AND ENGINEERING — APPROVED AND FILED — 48978 — NUMBER — EXAS

NOTE:
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EXIST DLP	:	TO REMAIN IN PLACE
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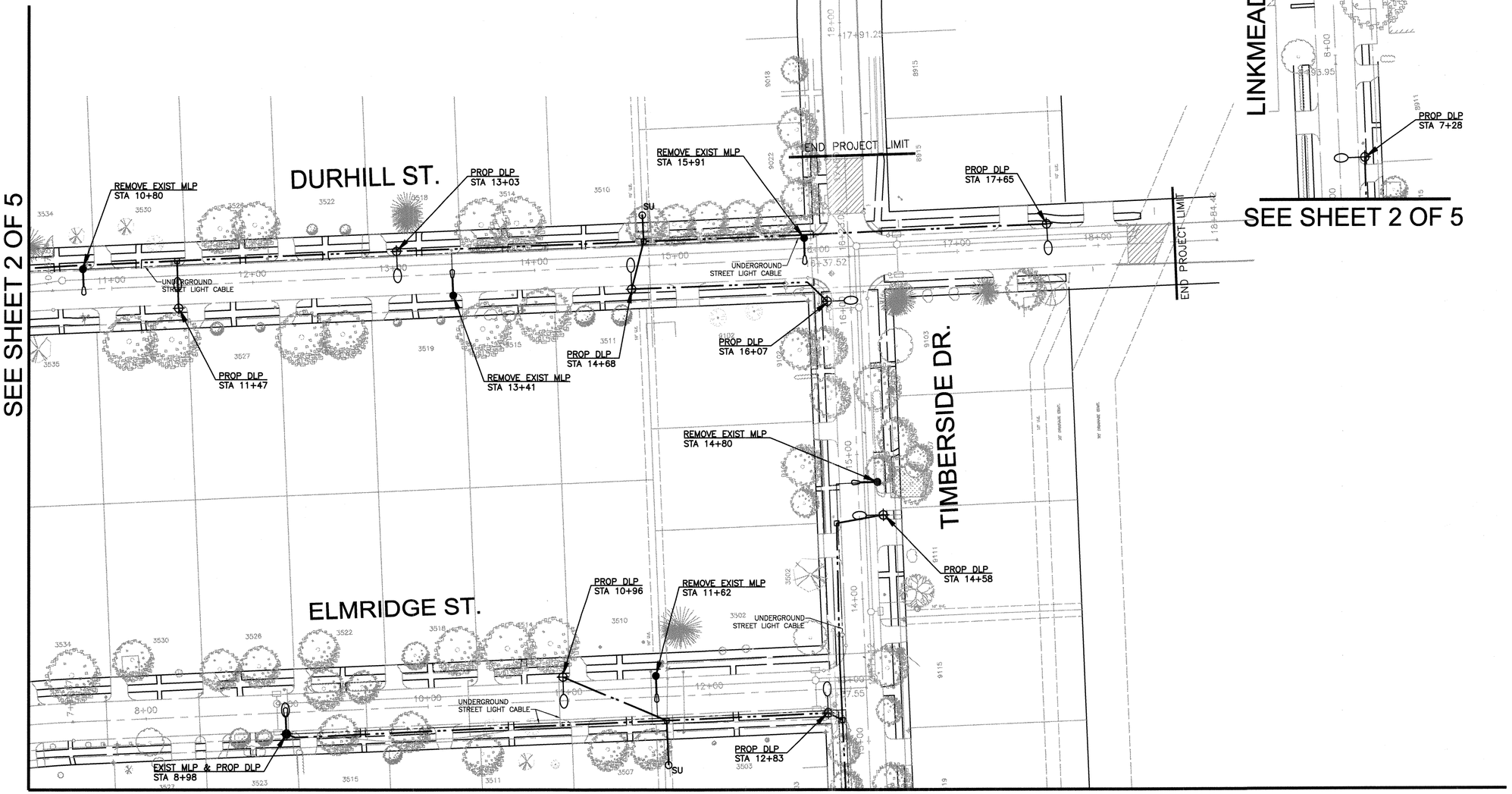
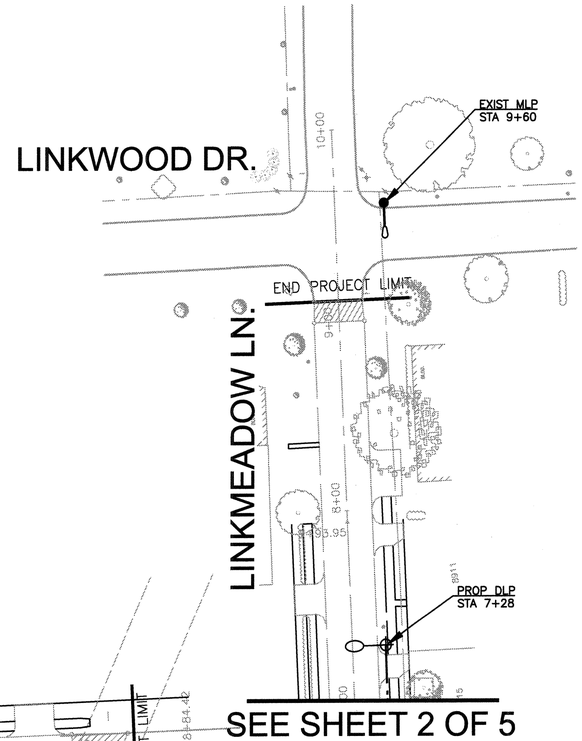
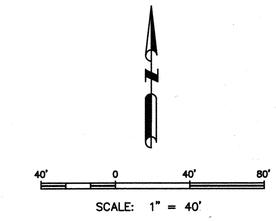
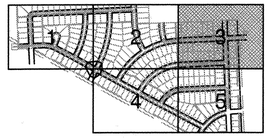
REMOVE EXIST MLP	:	TO BE REMOVED FROM SITE
EXIST MLP & PROP DLP	:	TO BE REMOVED FROM SITE & REPLACED

LEGEND	
	PROP. STREET LIGHT (DECORATIVE OUTDOOR: SEE SHEET 5 OF 5)
	EXIST. STREET LIGHT
	PROP. PULL BOX (PULLBOX AND WARNING TAPE PROVIDED BY CENTERPOINT ENERGY) (INSTALLED PER CENTERPOINT ENERGY SPECIFICATIONS)
	EXIST. PULL BOX
	PROP. 2" UNDERGROUND CONDUIT
	EXIST. CONDUIT
	EXIST. WOOD POWER POLE
SU	STUB UP OF CONDUIT AT POWER POLE OR EXISTING POWER SOURCE
	EXIST STREET LIGHT ON WOODEN POLE









KEY PLAN

MK.	DESCRIPTION	DATE	DWN.	CHK.
	REVISIONS			

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STATE OF TEXAS
VINCENT N. JACOB
98325
LICENSED
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10/31/11

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STATE OF TEXAS
RAHIM TAZEHZADEH
88923
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10/31/11

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051	Dwn By: BD/DS
Date: September 2011	Chkd By: V. Jacob

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

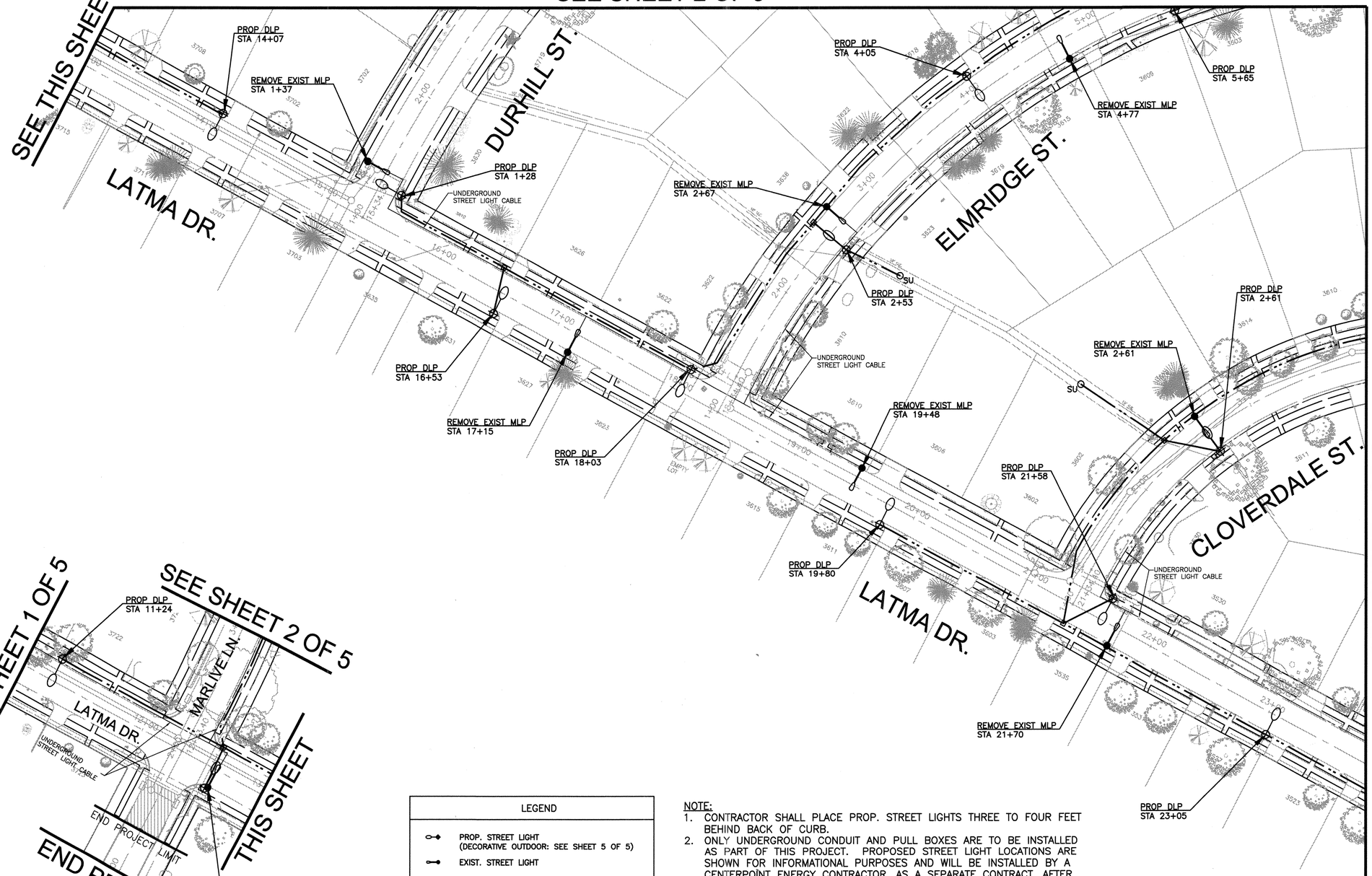
City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

STREET LIGHTING
PLAN
SHEET 3 OF 5

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	
DRAWING SCALE	
1" = 40'	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	
SHEET No: 71 OF 122	

PUBLIC WORKS AND ENGINEERING
APPROVED AND FILED
48978
CONTROL NUMBER
TEXAS

SEE SHEET 2 OF 5



LATMA DR. AND MARLIVE LN.
INTERSECTION

LEGEND	
	PROP. STREET LIGHT (DECORATIVE OUTDOOR: SEE SHEET 5 OF 5)
	EXIST. STREET LIGHT
	PROP. PULL BOX (PULLBOX AND WARNING TAPE PROVIDED BY CENTERPOINT ENERGY) (INSTALLED PER CENTERPOINT ENERGY SPECIFICATIONS)
	EXIST. PULL BOX
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	EXIST. CONDUIT
	EXIST. WOOD POWER POLE
SU	STUB UP OF CONDUIT AT POWER POLE OR EXISTING POWER SOURCE
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NOTE:
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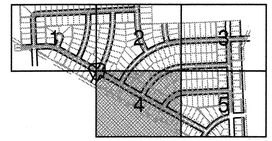
40' 0 40' 80'
SCALE: 1" = 40'



KEY PLAN

SEE SHEET 5 OF 5

MK.	DESCRIPTION	DATE	DWN.	CHK.

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SURVEYED BY:
Landtech Consultants, Inc.
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Job No.: 09-051 | Dwn By: BD/DS

Date: September 2011 | Chkd By: V. Jacob

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

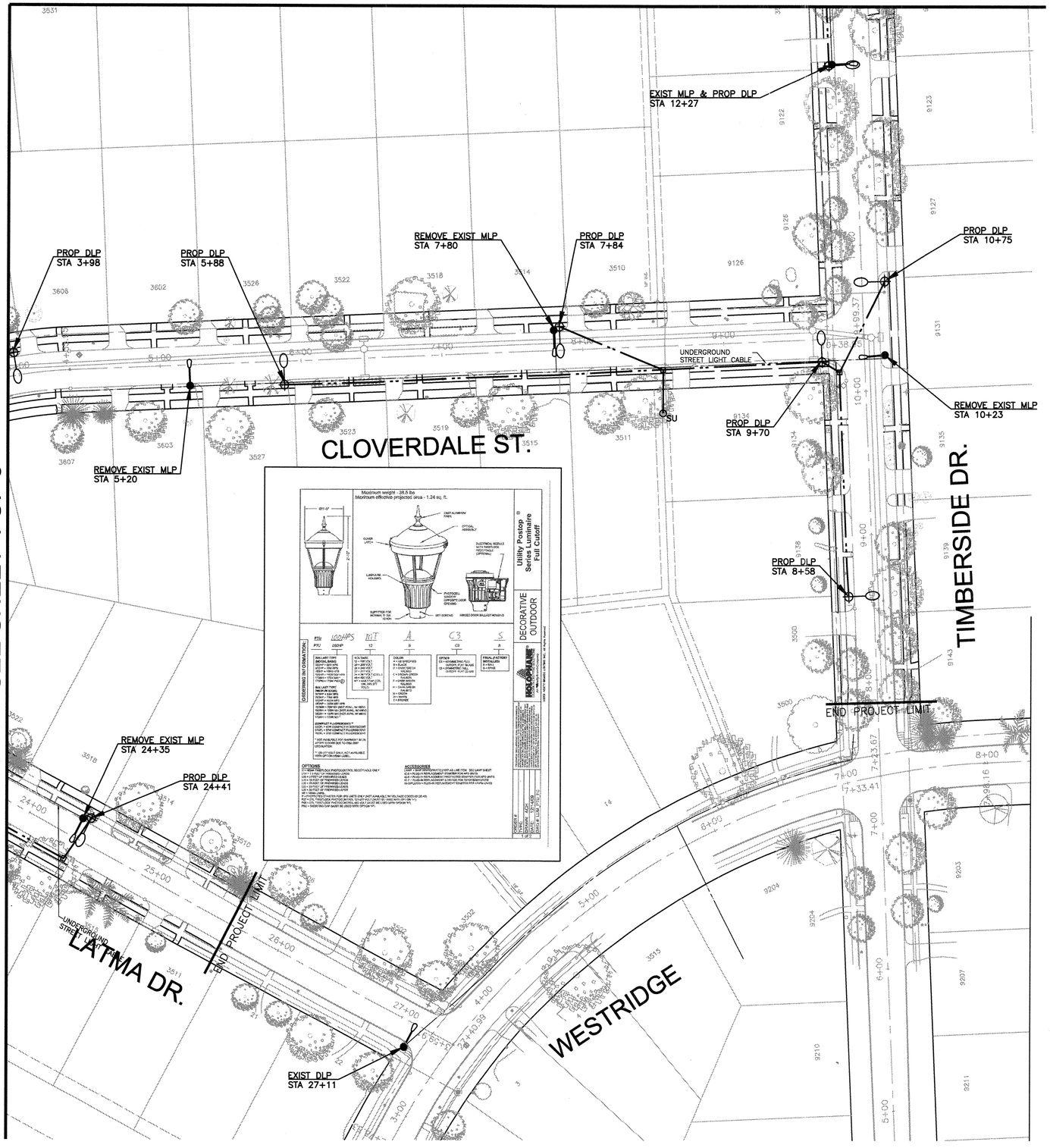
STREET LIGHTING
PLAN
SHEET 4 OF 5

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	
DRAWING SCALE	
1" = 40'	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	
SHEET No: 72 OF 122	

PUBLIC WORKS AND ENGINEERING
ACCEPTED AND FILED
48978
CONTROL NUMBER
TEXAS

SEE SHEET 3 OF 5

SEE SHEET 4 OF 5



LEGEND	
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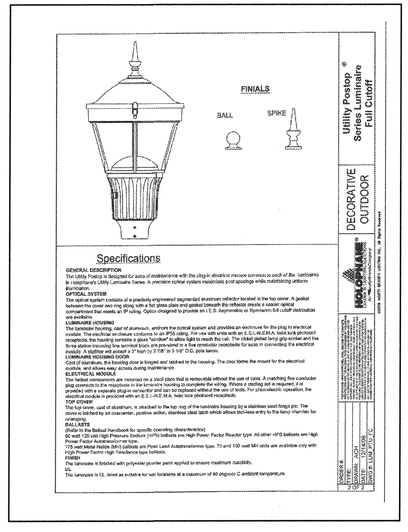
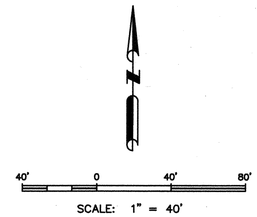
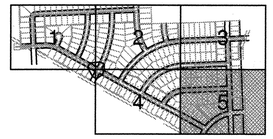
REMOVE EXIST MLP	:	TO BE REMOVED FROM SITE
EXIST MLP & PROP DLP	:	TO BE REMOVED FROM SITE & REPLACED







KEY PLAN

MK.	DESCRIPTION	DATE	DWN.	CHK.
	REVISIONS			

HDR | CLAUNCH & MILLER
Engineering Consultants
4635 Southwest Freeway, Suite 1000 • Houston, Texas 77027
(713) 622-9264 • Fax (713) 622-9265 • www.hdrinc.com
HDR Engineering Inc. Texas Reg. No. F-754

iSani CONSULTANTS
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HOUSTON, TX 77054
TEL: (713) 747-3399 FAX: (713) 748-3748
Texas Reg. No. F-4575

STATE OF TEXAS
VINCENT N. JACOB
98325
LICENSED
PROFESSIONAL ENGINEER
10/31/11

Infrastructure Associates
INFRASTRUCTURE ASSOCIATES, INC.
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HOUSTON, TEXAS 77057
TBPE REGISTRATION NO. F-4606
(713) 622-2120 PH (713) 622-0557 FAX
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RAHIM TAZEHZADEH
88923
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PROFESSIONAL ENGINEER
10/31/11

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051	Dwn By: BD/DS
Date: September 2011	Chkd By: V. Jacob

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

STREET LIGHTING
PLAN
SHEET 5 OF 5

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	PUBLIC WORKS AND ENGINEERING — ACCEPTED AND FILED — 48978 — ID NUMBER
DRAWING SCALE	
1" = 40'	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	
SHEET No: 73 OF 122	

MB

LEGEND

- RFB — REINFORCED FILTER FABRIC BARRIER.
- FF — FILTER FABRIC FENCE
- IPB — INLET PROTECTION BARRIER (STAGE II & EXISTING)
- IST — INLET SEDIMENT TRAP (STAGE I)
- F → — FLOW DIRECTION
- SCA (STABILIZED CONSTRUCTION ACCESS)

IST, IPB
IST, IPB
IST, IPB
IST, IPB
RFB
IPB
IPB
SCA
IST, IPB
IST, IPB
IST, IPB
IST, IPB
SCA
END PROJECT LIMIT

MURWORTH DR.
STELLA LINK RD.
SILVER SPRING LN.
LATMA CT.
LATMA DR.
LATMA DR.
KAPRI LN.

SEE SHEET 2 OF 5
SEE SHEET 4 OF 5

40' 0 40' 80'
SCALE: 1" = 40'

KEY PLAN

NOTES

A INSTALL FILTER FABRIC FENCE ALONG THE BACK OF CURB LINE DURING STORM SEWER INSTALLATION.

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MK.	DESCRIPTION	DATE	DWN.	CHK.

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STATE OF TEXAS
VINCENT N. JACOB
98325
LICENSED PROFESSIONAL ENGINEER
Vincent N. Jacob
10/5/11

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 | Dwn By: BD/DS
Date: September 2011 | Chkd By: V. Jacob

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

STORM WATER POLLUTION PREVENTION PLAN

SHEET 1 OF 5

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	
DRAWING SCALE	
1" = 40'	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	

PUBLIC WORKS AND ENGINEERING — REVIEWED AND FILED — 48978 — NUMBER — TEXAS

SHEET No: 74 OF 122

SEE SHEET 1 OF 5

SEE SHEET 3 OF 5

SEE SHEET 4 OF 5

SEE SHEET 4 OF 5

SEE SHEET 3 OF 5

IST, IPB

IST, IPB

IST, IPB

IST, IPB

IST, IPB

IST, IPB

IST, IPB

SCA

RFB

MURWORTH DR.

LINKMEADOW LN.

MARLIVE LN.

ILONA LN.

DURHILL ST.

ELMRIDGE ST.

END PROJECT LIMIT

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N

40' 0 40' 80'

SCALE: 1" = 40'

KEY PLAN

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STATE OF TEXAS — VINCENT N. JACOB — 98325 — LICENSED PROFESSIONAL ENGINEER — 10/5/11

Job No.: 09-051 | Dwn By: BD/DS

Date: September 2011 | Chkd By: V. Jacob

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

STORM WATER POLLUTION PREVENTION PLAN

SHEET 2 OF 5

WBS NO.	FOR CITY OF HOUSTON USE ONLY
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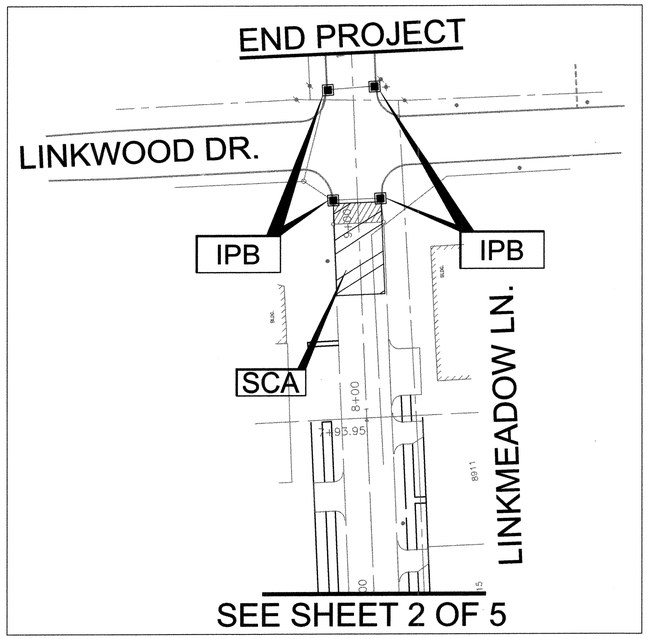
DRAWING SCALE	
1" = 40'	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	

SHEET No: 75 OF 122



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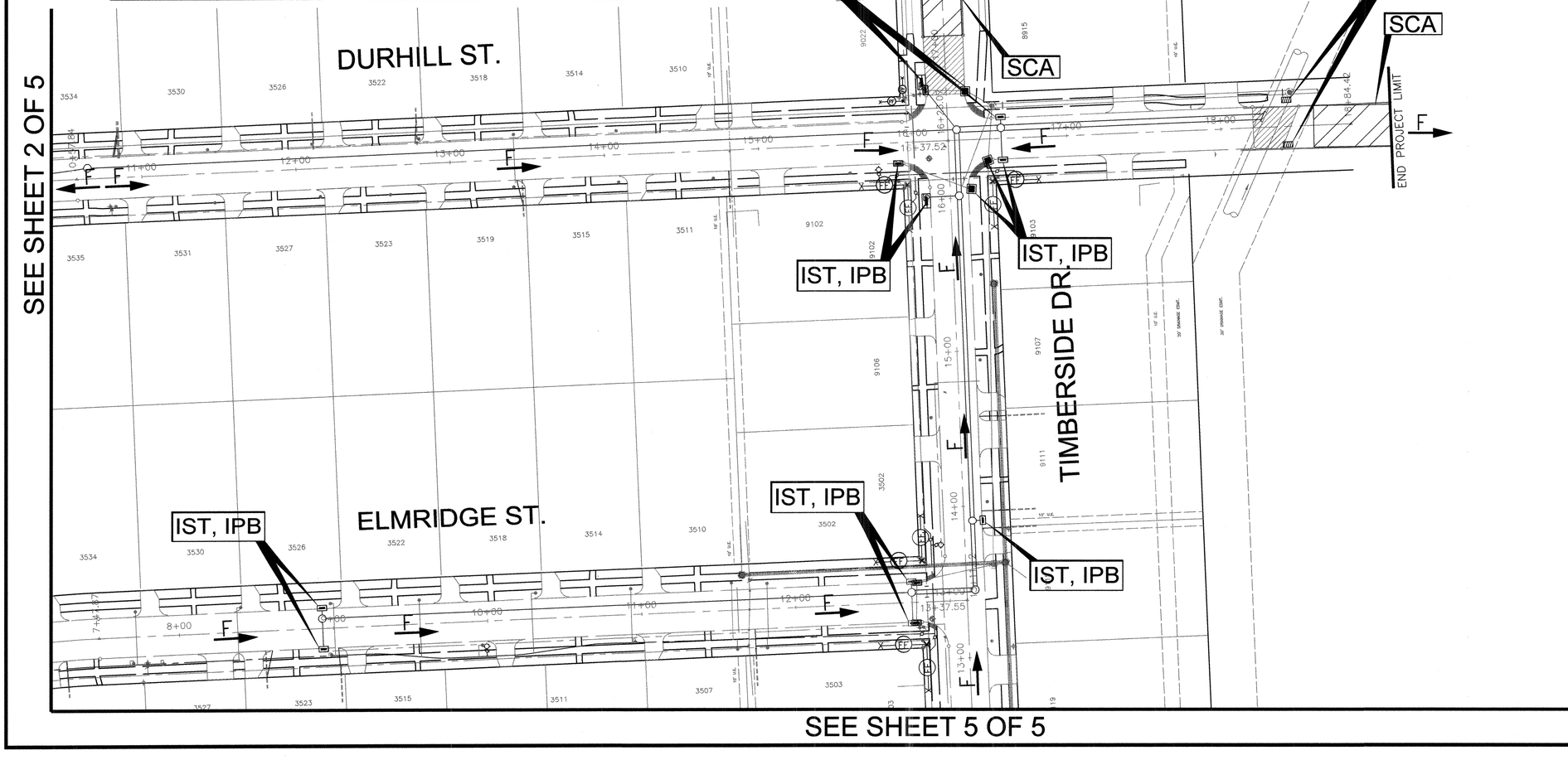
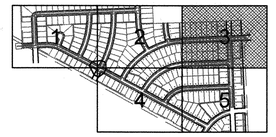
SCALE: 1" = 40'





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98325
LICENSED PROFESSIONAL ENGINEER
Vincent N. Jacob
10/5/11

Job No.: 09-051	Dwn By: BD/DS
Date: September 2011	Chkd By: V. Jacob

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

STORM WATER POLLUTION PREVENTION PLAN

SHEET 3 OF 5

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N-000378-0002-4	
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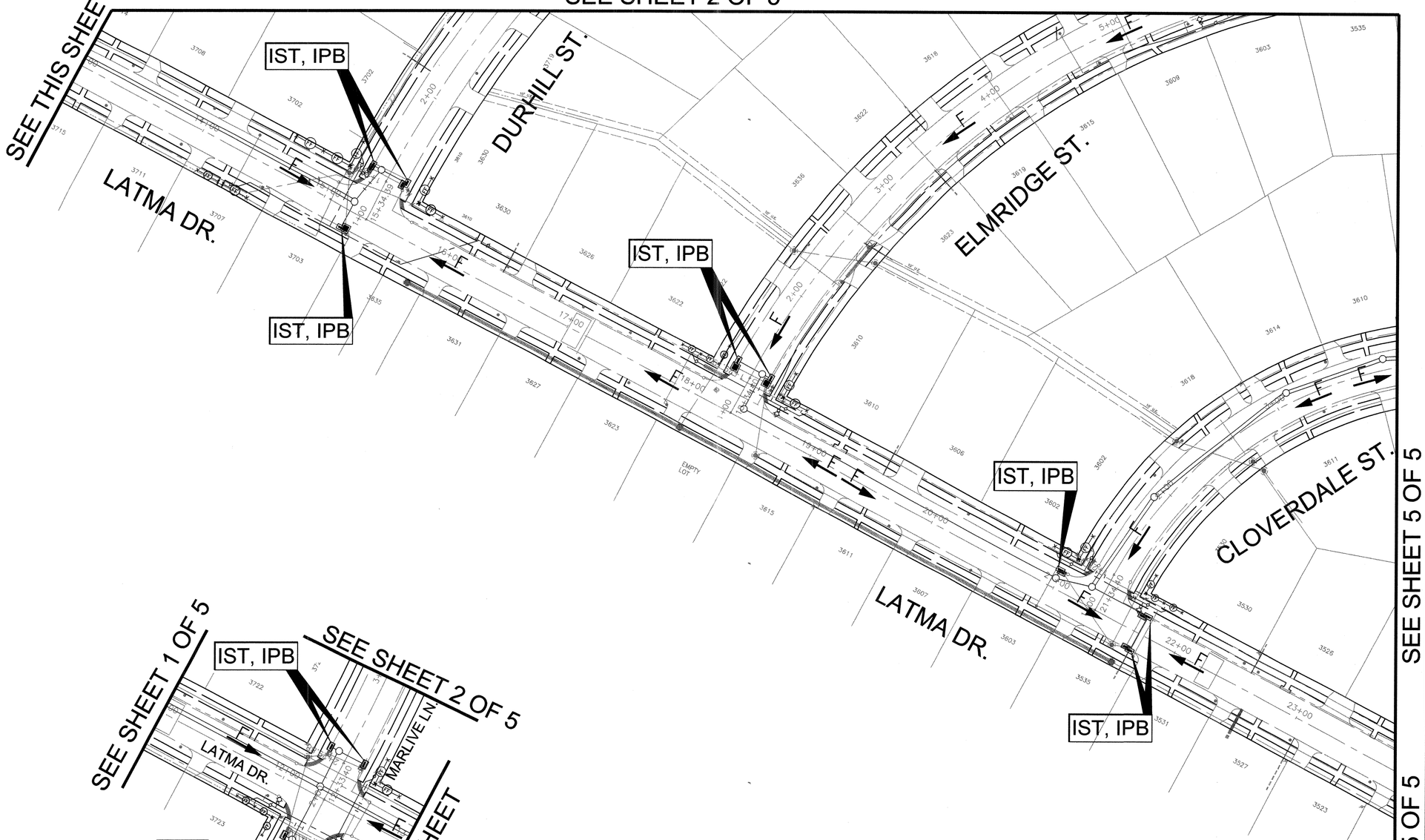
MARK BOARD, P.E.	
SHEET No: 76 OF 122	

PUBLIC WORKS AND ENGINEERING
REVIEWED AND FILED
48978
NUMBER

SEE SHEET 2 OF 5

SEE THIS SHEET

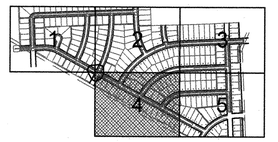


LATMA DR. AND MARLIVE LN.
INTERSECTION

40' 0 40' 80'

SCALE: 1" = 40'

SEE SHEET 5 OF 5



KEY PLAN

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REVISIONS

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STATE OF TEXAS
VINCENT N. JACOB
98325
LICENSED PROFESSIONAL ENGINEER
10/5/11

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051	Dwn By: BD/DS
Date: September 2011	Chkd By: V. Jacob

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

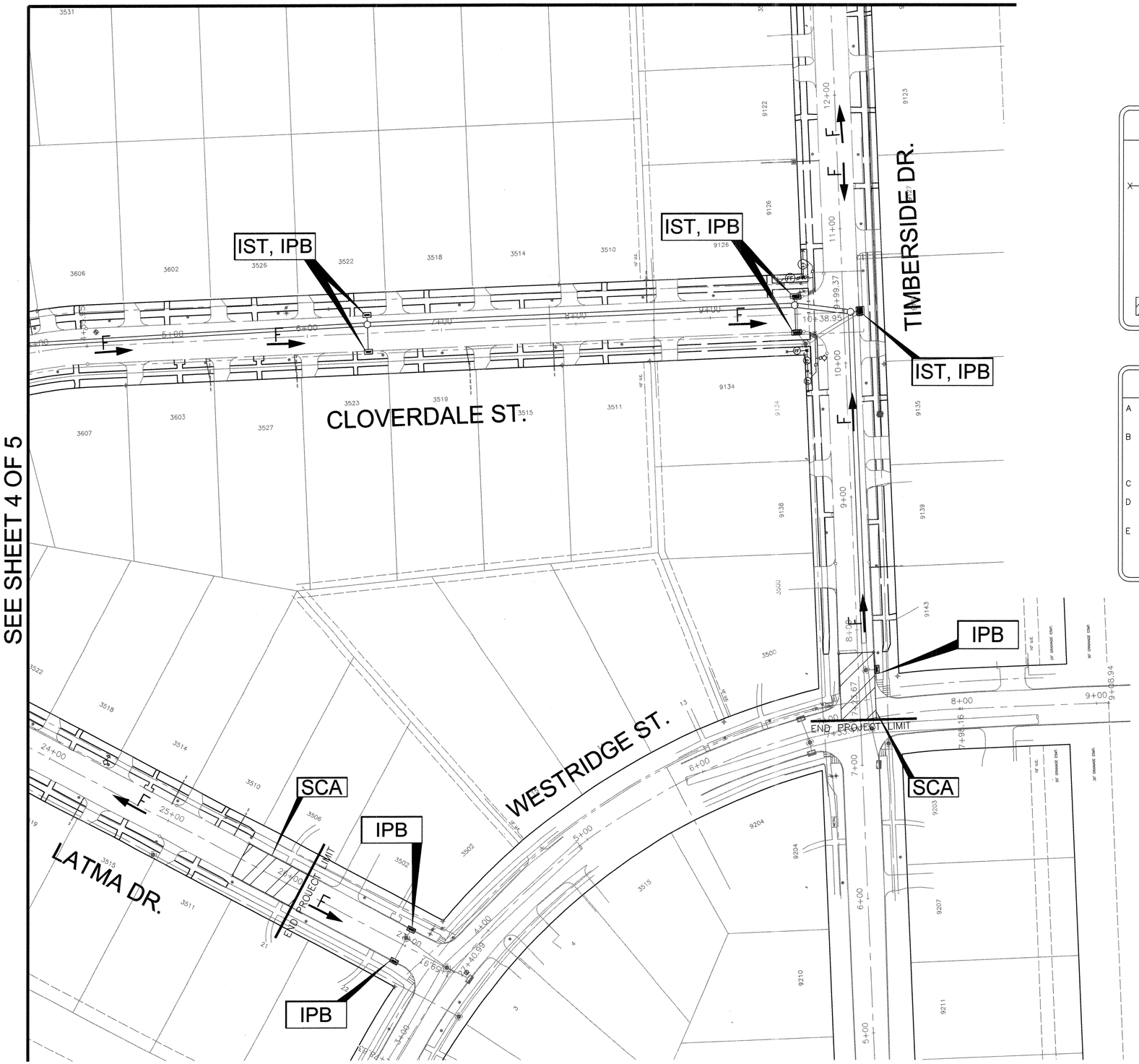
STORM WATER POLLUTION PREVENTION PLAN

SHEET 4 OF 5

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	
DRAWING SCALE	
1" = 40'	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	
SHEET No: 77 OF 122	

PUBLIC WORKS AND ENGINEERING
48978
NUMBER

SEE SHEET 3 OF 5



SEE SHEET 4 OF 5

LEGEND

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N

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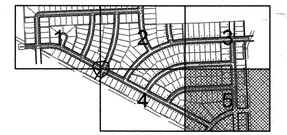
SCALE: 1" = 40'



KEY PLAN

MK.	DESCRIPTION	DATE	DWN.	CHK.

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CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

STORM WATER POLLUTION PREVENTION PLAN

SHEET 5 OF 5

WBS NO.	FOR CITY OF HOUSTON USE ONLY
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PUBLIC WORKS AND ENGINEERING
ACCEPTED AND FILED
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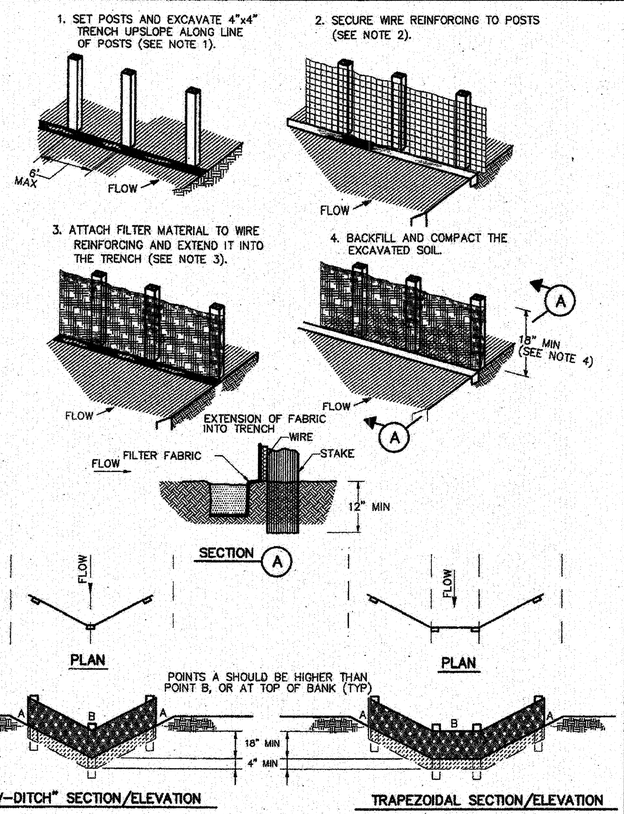
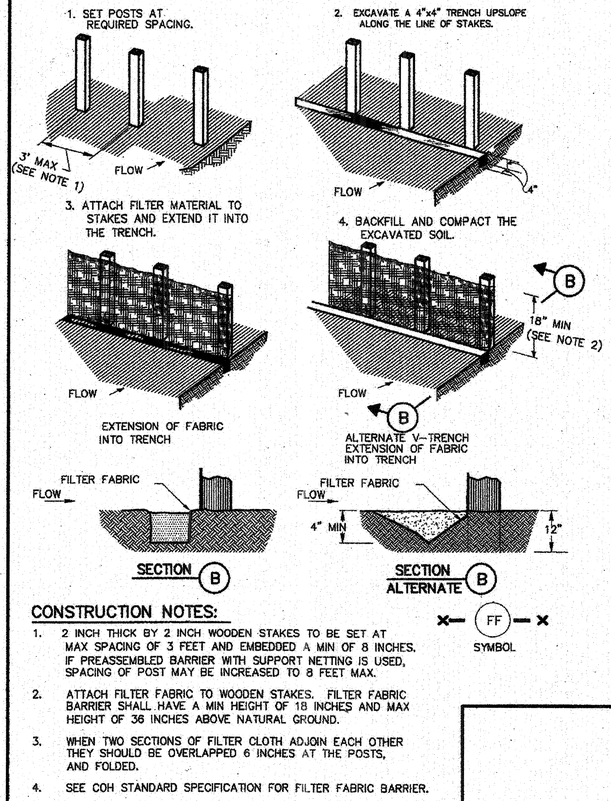


CONSTRUCTION NOTES:

1. SET 2 INCH BY 2 INCH WOODEN STAKES SPACED A MAX OF 6 FEET APART AND EMBEDDED A MIN OF 12 INCHES.
2. WOVEN WIRE REINFORCING TO BE FASTENED SECURELY TO BARRIER POSTS WITH STAPLES.
3. FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE REINFORCING, WITH TIES SPACED EVERY 24 INCHES AT TOP AND MIDSECTION.
4. MINIMUM HEIGHT OF FILTER SHOULD BE 18 INCHES AND A MAXIMUM OF 36 INCHES ABOVE NATURAL GROUND.
5. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED 6 INCHES AT THE POSTS, AND FOLDED.
6. SEE COH STANDARD SPECIFICATION FOR FILTER FABRIC BARRIER.

SYMBOL

REINFORCED FILTER FABRIC BARRIER

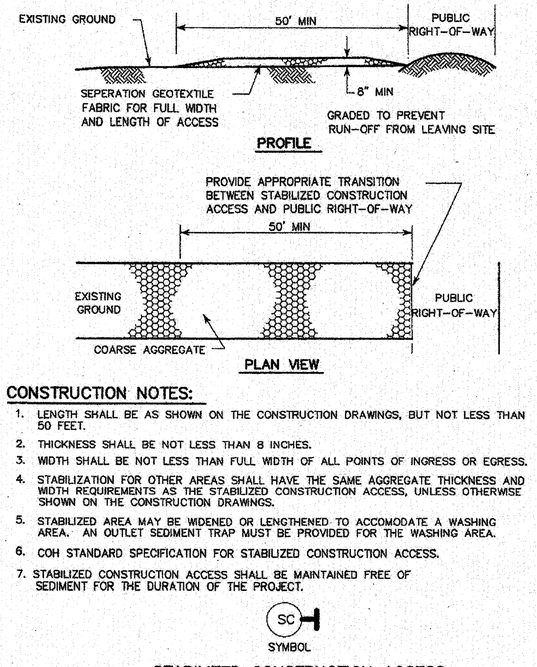


CONSTRUCTION NOTES:

1. 2 INCH THICK BY 2 INCH WOODEN STAKES TO BE SET AT MAX SPACING OF 3 FEET AND EMBEDDED A MIN OF 8 INCHES. IF PREASSEMBLED BARRIER WITH SUPPORT NETTING IS USED, SPACING OF POST MAY BE INCREASED TO 8 FEET MAX.
2. ATTACH FILTER FABRIC TO WOODEN STAKES. FILTER FABRIC BARRIER SHALL HAVE A MIN HEIGHT OF 18 INCHES AND MAX HEIGHT OF 36 INCHES ABOVE NATURAL GROUND.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHOULD BE OVERLAPPED 6 INCHES AT THE POSTS, AND FOLDED.
4. SEE COH STANDARD SPECIFICATION FOR FILTER FABRIC BARRIER.

SYMBOL

FILTER FABRIC BARRIER

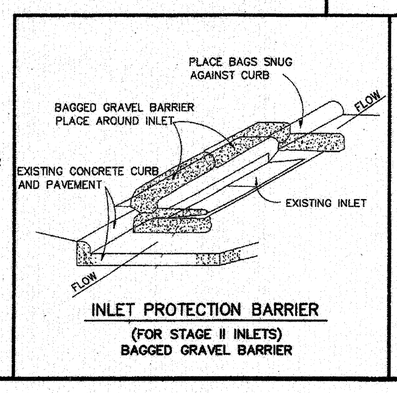


CONSTRUCTION NOTES:

1. LENGTH SHALL BE AS SHOWN ON THE CONSTRUCTION DRAWINGS, BUT NOT LESS THAN 50 FEET.
2. THICKNESS SHALL BE NOT LESS THAN 8 INCHES.
3. WIDTH SHALL BE NOT LESS THAN FULL WIDTH OF ALL POINTS OF INGRESS OR EGRESS.
4. STABILIZATION FOR OTHER AREAS SHALL HAVE THE SAME AGGREGATE THICKNESS AND WIDTH REQUIREMENTS AS THE STABILIZED CONSTRUCTION ACCESS, UNLESS OTHERWISE SHOWN ON THE CONSTRUCTION DRAWINGS.
5. STABILIZED AREA MAY BE WIDENED OR LENGTHENED TO ACCOMODATE A WASHING AREA. AN OUTLET SEDIMENT TRAP MUST BE PROVIDED FOR THE WASHING AREA.
6. COH STANDARD SPECIFICATION FOR STABILIZED CONSTRUCTION ACCESS.
7. STABILIZED CONSTRUCTION ACCESS SHALL BE MAINTAINED FREE OF SEDIMENT FOR THE DURATION OF THE PROJECT.

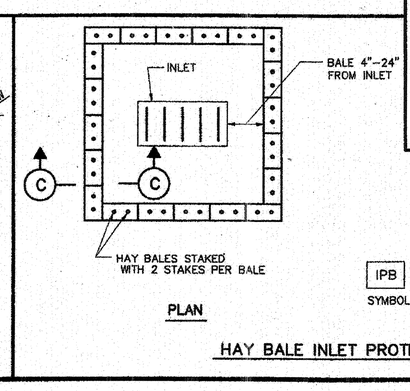
SC
SYMBOL

STABILIZED CONSTRUCTION ACCESS

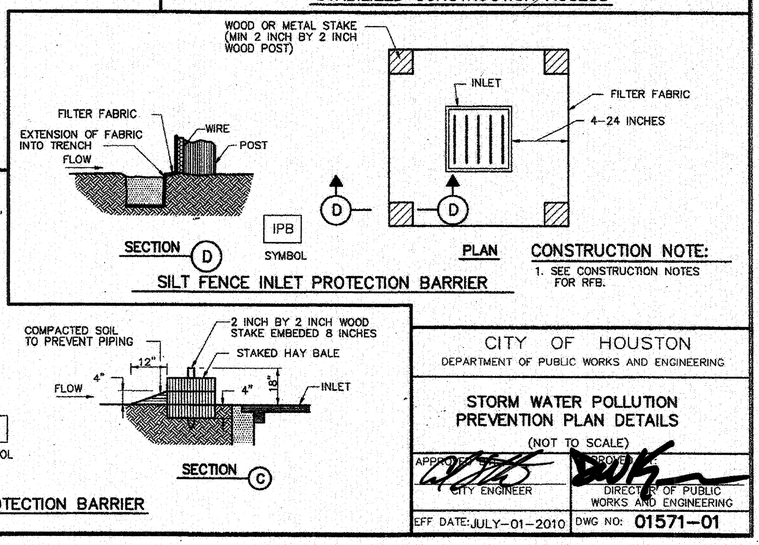


INLET PROTECTION BARRIER

(FOR STAGE II INLETS)
BAGGED GRAVEL BARRIER



HAY BALE INLET PROTECTION BARRIER



SILT FENCE INLET PROTECTION BARRIER

CONSTRUCTION NOTE:

1. SEE CONSTRUCTION NOTES FOR RFB.

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

STORM WATER POLLUTION PREVENTION PLAN DETAILS

(NOT TO SCALE)

APPROVED: CITY ENGINEER
APPROVED: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JULY-01-2010
DWG NO: 01571-01

MK.	DESCRIPTION	DATE	DWN.	CHK.

REVISIONS

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MARK BOARD, P.E.	
SHEET No: 79 OF 122	

PUBLIC WORKS AND ENGINEERING
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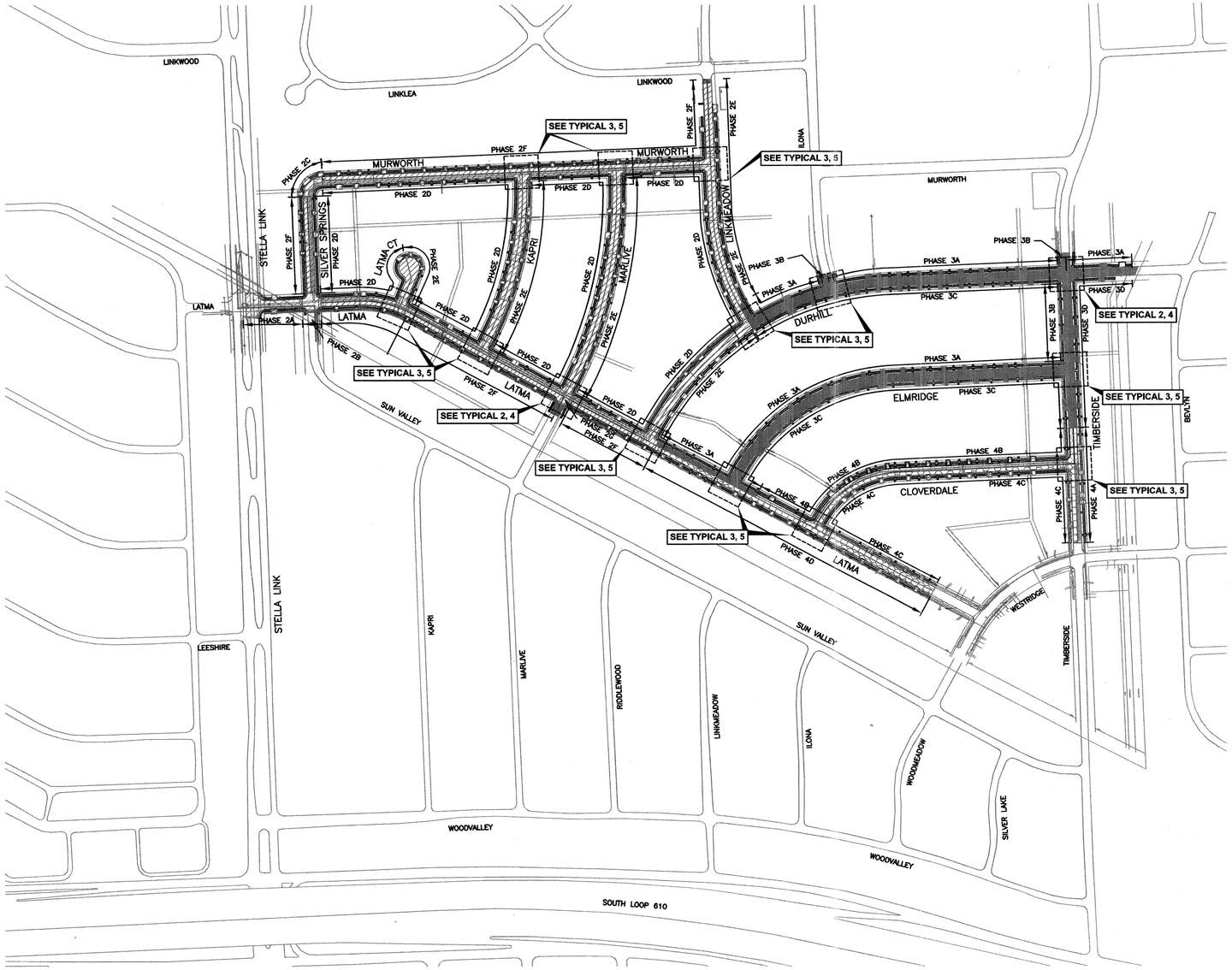
TEXAS

SEE TYPICAL1 FOR TYPICAL ONE-LANE ROAD CLOSURE DETOURS



LEGEND

PHASE 2

PHASE 3

PHASE 4

200' 0 200' 400'

SCALE: 1" = 200'

MK.	DESCRIPTION	DATE	DWN.	CHK.

REVISIONS

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Landtech Consultants, Inc.
FB NO. PB#5543

STATE OF TEXAS
VINCENT N. JACOB
98325
LICENSED PROFESSIONAL ENGINEER
Vincent N. Jacob
01/06/12

Job No.: 09-051	Dwn By: BD/DS
Date: November 2011	Chkd By: V. Jacob

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

TRAFFIC CONTROL PLAN
PHASING LAYOUT
SHEET 1 OF 11

WBS NO.
N-000378-0002-4
DRAWING SCALE
1" = 200'
CITY OF HOUSTON PM
MARK BOARD, P.E.
SHEET No: 80 OF 122

FOR CITY OF HOUSTON USE ONLY

PUBLIC WORKS AND ENGINEERING
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GENERAL NOTES FOR TRAFFIC HANDLING

1. THE CONSTRUCTION TRAFFIC CONTROL SIGNS, DEVICES, AND BARRICADES ON THESE DRAWINGS CONSTITUTE MINIMUM REQUIREMENTS AND ARE NOT INCLUDED TO COVER SPECIAL CIRCUMSTANCES OR OTHER CONDITIONS THAT MAY ARISE DUE TO UNFORESEEN FIELD CONDITIONS. THE CONTRACTOR SHALL PLACE AND MAINTAIN SUFFICIENT ADDITIONAL SIGNS, BARRICADES, AND WARNING DEVICES TO WARN THE PUBLIC AND PROVIDE FOR THE SAFE MOVEMENT OF TRAFFIC AND CONSTRUCTION ZONE SAFETY WHERE PROJECT REQUIREMENTS ARE NOT FULLY SATISFIED BY THE STANDARDS SHOWN HEREON. "THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" SHALL GOVERN.
2. CONTRACTOR SHALL PROVIDE AND INSTALL ALL TRAFFIC CONTROL DEVICES IN CONFORMANCE WITH PART VI OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (T.M.U.T.C.D.), MOST RECENT EDITION WITH REVISIONS, DURING CONSTRUCTION.
3. ALL SIGNS AND MARKINGS SHALL COMPLY WITH THE REQUIREMENTS OF THE TEXAS MANUAL ON UNIFORM CONTROL DEVICES FOR STREETS AND HIGHWAYS, UNLESS SPECIFICALLY DIRECTED BY THE TRAFFIC ENGINEER OR SPECIFIED ON THE PLANS.
4. BARRICADES, SIGNS, CHANNELIZING DEVICES, AND TRAFFIC HANDLING DEVICES AS SHOWN SHALL BE ADJUSTED TO FIT FIELD CONDITIONS, AS DIRECTED BY THE ENGINEER.
5. NO LANES ON MAJOR THOROUGHFARES MAY BE BLOCKED FROM 6:00 AM TO 9:00 AM AND 4:00 PM TO 7:00 PM UNLESS OUTLINED IN THE MOBILITY PERMIT.
6. CONTRACTOR SHALL MAINTAIN ONE LANE OF TRAFFIC IN EACH DIRECTION DURING WORKING HOURS WHENEVER POSSIBLE, ELSE SHOULD MAINTAIN THE TRAFFIC AS SHOWN IN THE TRAFFIC CONTROL PLANS.
7. CONTRACTOR SHALL PROVIDE ACCESS TO ALL BUSINESSES ALONG THIS PROJECT AT ALL TIMES DURING CONSTRUCTION UNLESS OTHERWISE AUTHORIZED SPECIFICALLY BY THE ENGINEER.
8. ALL EXISTING STOP SIGNS, STREET NAME SIGNS, AND WARNING SIGNS SHALL BE MAINTAINED IN PLACE DURING THE ENTIRE PERIOD OF CONSTRUCTION BY THE CONTRACTOR.
9. THE ENGINEER MAY DIRECT THE CONTRACTOR TO FURNISH ADDITIONAL SIGNS, BARRICADES, AND CHANNELIZING DEVICES AS REQUIRED TO MAINTAIN TRAFFIC AND CONSTRUCTION ZONE SAFETY DURING CONSTRUCTION. ANY SUCH ADDITIONAL SIGNS, BARRICADES, ETC. SHALL BE CONSIDERED A PART OF THE LUMP SUM PAY ITEM.
10. WHEN DIRECTED BY THE ENGINEER, THE CONTRACTOR SHALL PROVIDE FLAGGERS TO DIRECT TRAFFIC. FLAGGERS SHALL BE OFF-DUTY UNIFORMED POLICE OFFICERS AND SHALL BE PAID FOR BY THE CONTRACTOR. THIS DOES NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY OR TAKING OTHER STEPS AND PROVIDING OTHER PERSONNEL WHICH THE CONTRACTOR MAY DEEM NECESSARY FOR PROTECTION OF WORK AND THE PUBLIC.
11. CONTRACTOR SHALL INSURE THAT ALL BARRICADES, SIGNS, CHANNELIZING DEVICES, WARNING LIGHTS, AND TRAFFIC HANDLING DEVICES ARE MAINTAINED IN CLEAN FUNCTIONAL CONDITION AT ALL TIMES.
12. ALL SIGNS, WARNING DEVICES, AND BARRICADES ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR, INCLUDING ACTS OF VANDALISM OR ACCIDENT.
13. ALL CONSTRUCTION SIGNS MOUNTED ON BARRICADES SHALL BE EQUIPPED WITH TYPE "A" WARNING LIGHTS (TWO PER STRUCTURE).
14. PORTABLE SIGNS MAY BE PROVIDED BETWEEN LOCATIONS AS REQUIRED FOR CONSTRUCTION. THESE HAVE TO BE APPROVED BY THE TRAFFIC ENGINEER.
15. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN THE TEMPORARY AND EXISTING PAVEMENT MARKINGS AND SIGNING IN A GOOD VISIBLE CONDITION THROUGHOUT THE LENGTH OF THE PROJECT.
16. THE CONTRACTOR SHALL SEQUENCE THE CONSTRUCTION IN SUCH A MANNER THAT NO ADJACENT CROSS STREETS AND MEDIAN OPENINGS ARE CLOSED AT THE SAME TIME.
17. THE CONTRACTOR SHALL MAINTAIN BARRICADES AND SAFETY FENCES AT EACH SITE WHERE PEDESTRIAN TRAFFIC IS EVIDENT.
18. THE CONTRACTOR SHALL REALIGN AND READJUST SIGNAL HEADS AS REQUIRED AND DIRECTED BY THE CITY OF HOUSTON AND THE FIELD ENGINEER DURING THE ENTIRE CONSTRUCTION ACTIVITY. IMMEDIATELY CALL THE CITY OF HOUSTON, SIGNAL DISPATCHER AT (832) 395-3000.
19. ALL TEMPORARY SIGNAL WORK AND REPAIR SHALL BE COMPLETED IN CONFORMANCE WITH TRAFFIC AND TRANSPORTATION BOOKLET 202 SPECIFICATIONS AND C-3900 SERIES STANDARD DRAWINGS AND CALL IMMEDIATELY THE CITY OF HOUSTON'S SIGNAL DISPATCHER AT (832) 395-3000.
20. THE CONTRACTOR SHALL CALL THE CITY OF HOUSTON TRAFFIC SIGNAL SHOP WHEN WORK IS SCHEDULED NEAR SIGNAL CONDUIT AT (832) 395-3000. CALL AT LEAST FIVE(5) WORKING DAYS IN ADVANCE.
21. THE CONTRACTOR SHALL REMOVE ALL EXISTING SIGNS AND STRIPING WHICH ARE IN CONFLICT WITH THE CONSTRUCTION SIGNS AND STRIPING. EXISTING PAVEMENT MARKINGS SHALL BE REMOVED IN AREAS WHERE TRAFFIC IS DIRECTED TO CROSS THEM. THE SIGNS SHALL BE PROPERLY STORED IN A SAFE PLACE UNTIL THE CONSTRUCTION HAS BEEN COMPLETED.
22. ALL CONSTRUCTION SIGNS, WARNING DEVICES, AND BARRICADES SHALL REMAIN IN PLACE UNTIL THEIR REMOVAL IS DIRECTED BY THESE PLANS OR BY THE ENGINEER.
23. AT THE CONCLUSION OF CONSTRUCTION, THE CONTRACTOR SHALL RESTORE ALL PAVEMENT MARKINGS AND SIGNS, SPEED HUMPS/CUSHIONS TO THEIR ORIGINAL CONDITION WITH TRAFFIC PAINT STRIPES RAISED PAVEMENT MARKER BUTTONS AND RE-INSTALL THE SIGNS AT THEIR EXISTING LOCATION.
24. CONSTRUCTION IN ANY AREA, THAT IS ADVERSELY AFFECTING TRAFFIC FLOW AND SAFETY, MUST BE PURSUED DILIGENTLY BY THE CONTRACTOR. IF, IN THE OPINION OF THE ENGINEER, THE CONTRACTOR IS NOT DIRECTLY PURSUING THE CONSTRUCTION IN THOSE AREAS, THE ENGINEER MAY REQUIRE THE CONTRACTOR TO CHANGE HIS/HER WORK SCHEDULE TO EXPEDITE COMPLETION IN THOSE AREAS OF CONCERN.
25. THE "TRAFFIC CONTROL PLANS" EXIST AS A PART OF CONTRACT DRAWINGS. THE OBJECTIVE IS TO MAINTAIN A SAFE AND EFFICIENT FLOW OF TRAFFIC THROUGH THE CONSTRUCTION AREA. SHOULD THE CONTRACTOR ELECT TO USE A DIFFERENT PLAN OF TRAFFIC CONTROL, HE/SHE SHALL PREPARE AND SUBMIT AN ALTERNATE SET OF PLANS TO THE TRAFFIC MANAGEMENT AND MAINTENANCE DIVISION, PUBLIC WORKS AND ENGINEERING DEPARTMENT, FOR REVIEW AND APPROVAL 10 WORKING DAYS PRIOR TO PROCEEDING WITH THE WORK. THESE PLANS SHALL BE PREPARED BY A REGISTERED PROFESSIONAL ENGINEER AND DRAWN TO AN ACCEPTABLE SCALE, ON REPRODUCIBLE MYLARS, AND SHALL BECOME PART OF THE CONTRACT DRAWING.
26. 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 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 THE REQUEST MAY BE DENIED. CALL 832-395-3020 FOR AN APPLICATION OR LOGON TO WWW.GIMS.HOUSTONTX.GOV.
27. CONTRACTOR SHALL COVER OPEN EXCAVATIONS WITH STEEL PLATES ANCHORED PROPERLY DURING NON-WORKING HOURS, AND OPEN LANES FOR NORMAL TRAFFIC FLOW.

TYPICAL SIGN SPACING, TAPER LENGTHS, AND SUGGESTED SPACING OF CHANNELIZATION DEVICES

		Min. Desirable Taper Length "L"			Suggested Maximum Spacing Of Device	
Posted Speed (mph)	Sign Spacing "X"	10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent
30	120'	150'	165'	180'	30'	60' – 75'
35	160'	205'	225'	245'	35'	70' – 90'
40	240'	265'	295'	320'	40'	80' – 100'
45	320'	450'	495'	540'	45'	90' – 110'
50	400'	500'	550'	600'	50'	100' – 125'
55	500'	550'	605'	660'	55'	110' – 140'

Length for Buffers	
Posted Speed (mph)	Length in Feet (B)
20	40
25	60
30	90
35	120
40	155
45	195
50	240
55	295
60	350
65	410
70	475

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DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

TRAFFIC CONTROL PLAN
GENERAL NOTES
SHEET 2 OF 11

WBS NO.
N-000378-0002-4
DRAWING SCALE
N.T.S
CITY OF HOUSTON PM
MARK BOARD, P.E.
SHEET No: 81 OF 122

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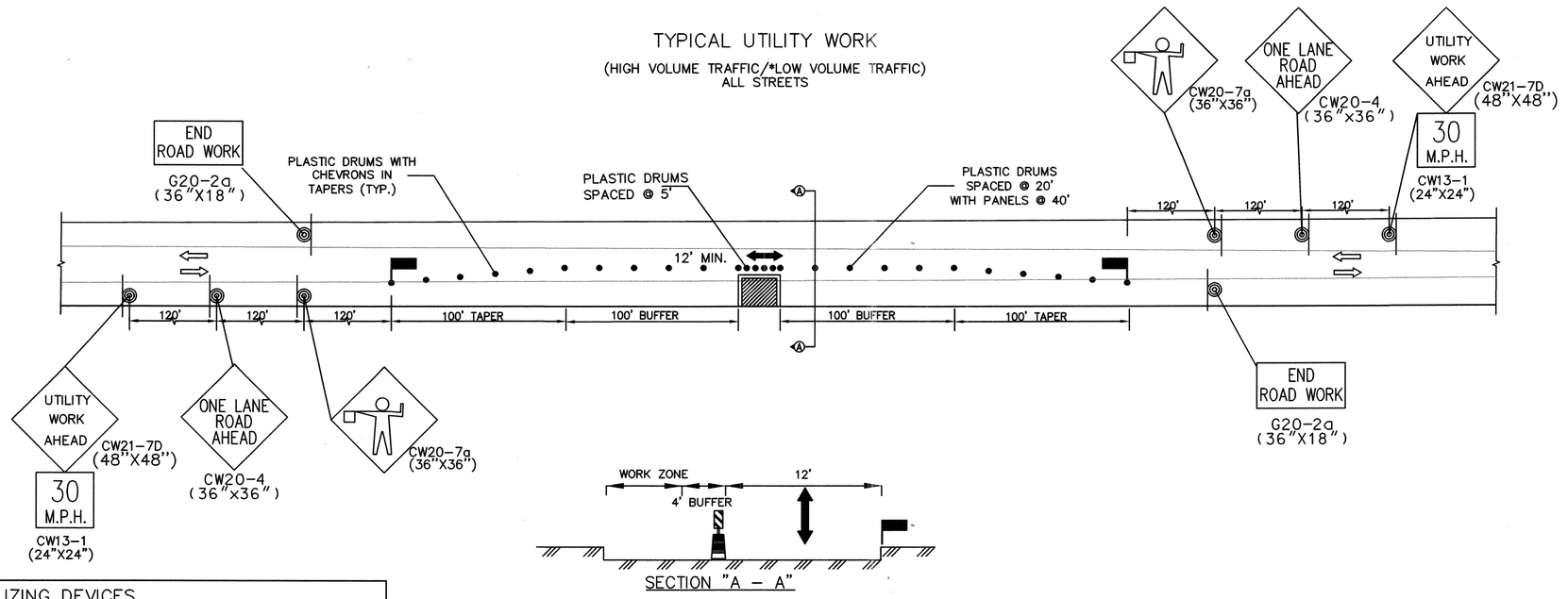
TYPICAL UTILITY WORK

(HIGH VOLUME TRAFFIC/*LOW VOLUME TRAFFIC)
ALL STREETS



SECTION "A – A"

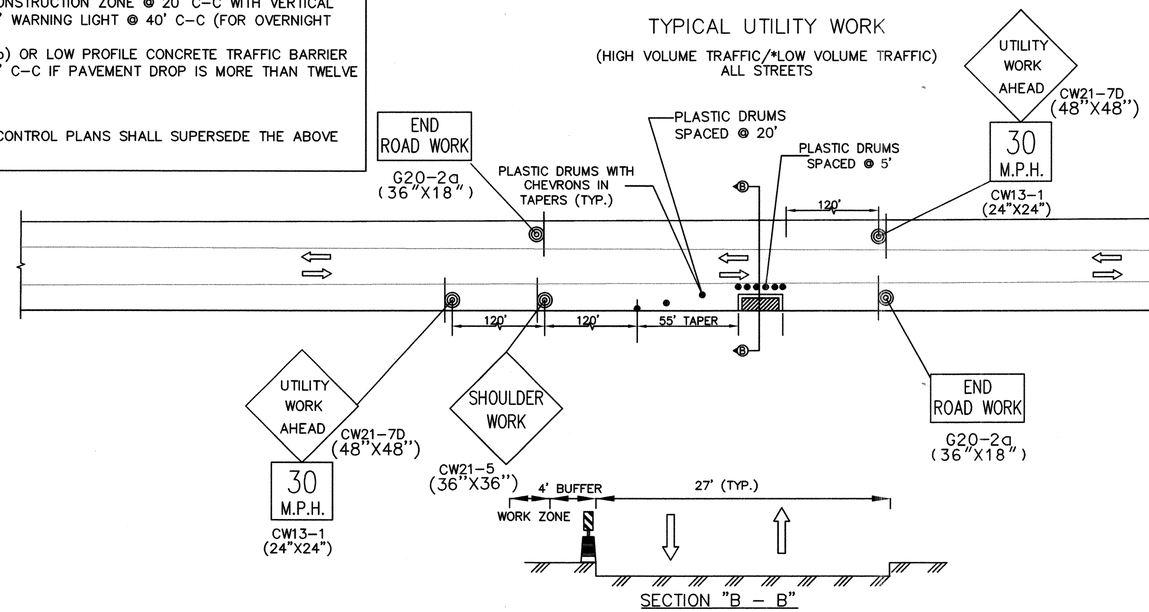
SPACING FOR CHANNELIZING DEVICES

1. PLASTIC DRUMS ON MERGING TAPER @ 30' C–C– WITH CHEVRON SIGN @ 60' C–C AND TYPE 'C' WARNING LIGHT (FOR OVERNIGHT CLOSURE)
2. PLASTIC DRUMS ON DOWNSTREAM TAPE @ 35' C–C
3. PLASTIC DRUMS ON RADII @ 5' C–C
4. PLASTIC DRUMS ON TANGENT @ 35' C–C WITH VERTICAL PANEL @ 70' C–C AND TYPE 'C' WARNING LIGHT @ 70' C–C (FOR OVERNIGHT CLOSURE)
5. PLASTIC DRUMS IN FRONT OF CONSTRUCTION ZONE @ 20' C–C WITH VERTICAL PANEL @ 40' C–C AND TYPE 'A' WARNING LIGHT @ 40' C–C (FOR OVERNIGHT CLOSURE)
6. CONCRETE TRAFFIC BARRIER (ctb) OR LOW PROFILE CONCRETE TRAFFIC BARRIER (LPCTB) WITH REFLECTORS @ 10' C–C IF PAVEMENT DROP IS MORE THAN TWELVE INCHES (12")
7. TUBULAR MARKER @ 20' C–C

NOTE: SPACING SHOWN ON TRAFFIC CONTROL PLANS SHALL SUPERSEDE THE ABOVE SPACINGS.

TYPICAL UTILITY WORK

(HIGH VOLUME TRAFFIC/*LOW VOLUME TRAFFIC)
ALL STREETS



SECTION "B – B"

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Neighborhood Street Reconstruction
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TRAFFIC CONTROL PLAN
PHASE 1 (WATER TYP. 1)
SHEET 3 OF 11

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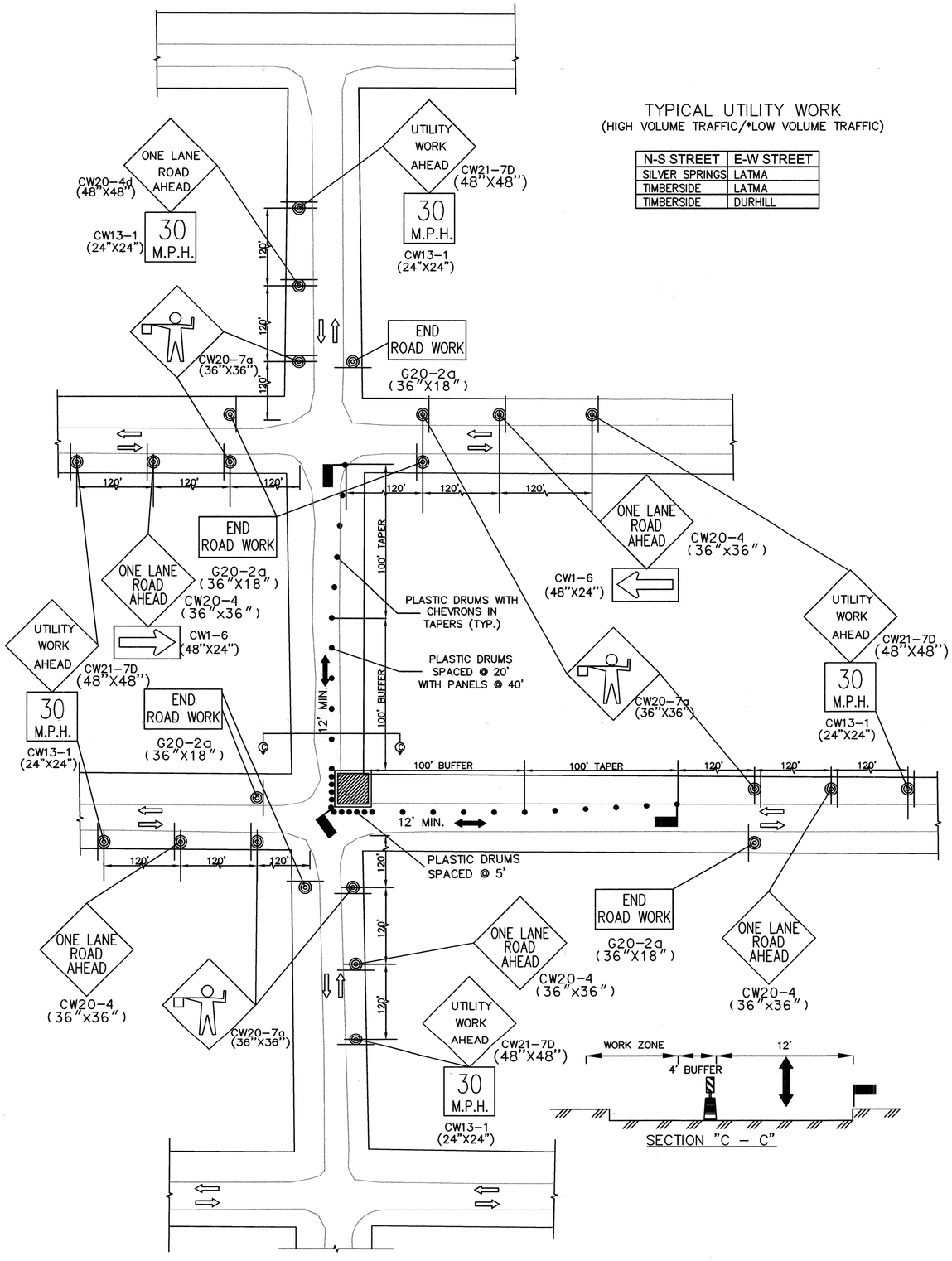
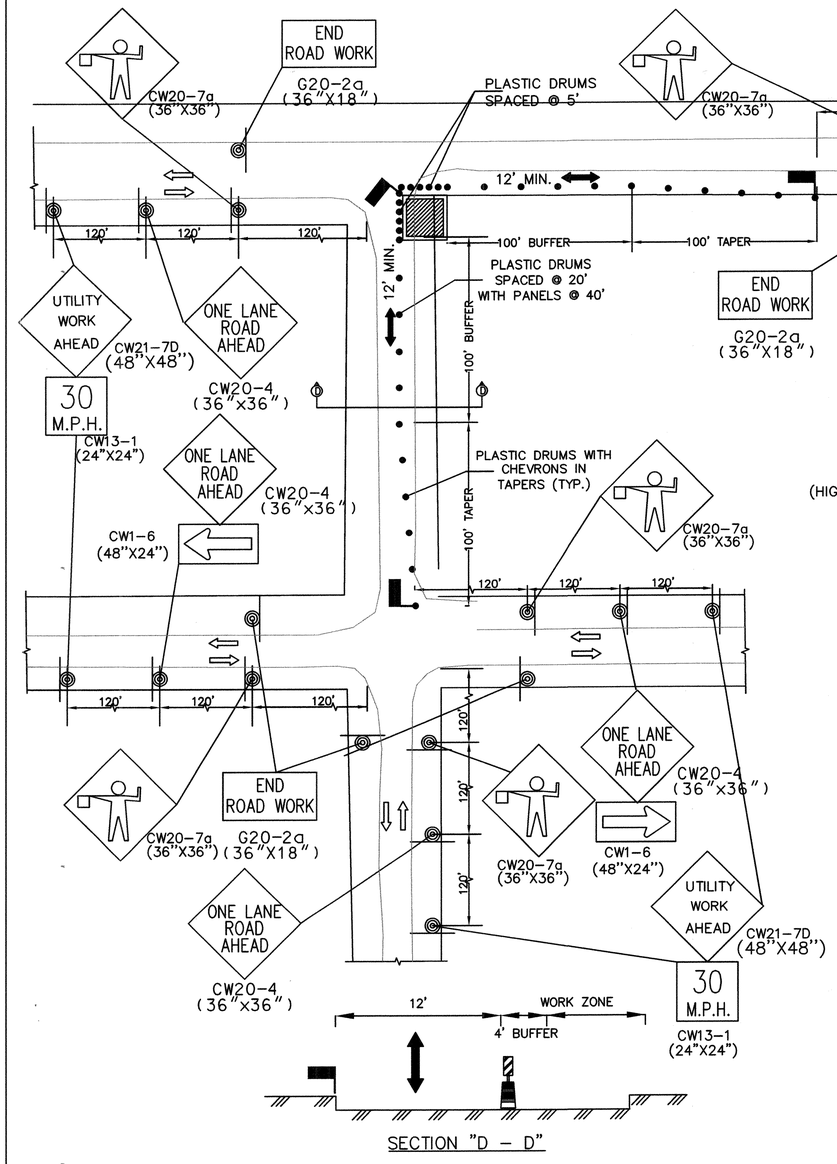


TYPICAL UTILITY WORK
(HIGH VOLUME TRAFFIC/*LOW VOLUME TRAFFIC)

N-S STREET	E-W STREET
SILVER SPRINGS	LATMA
TIMBERSIDE	LATMA
TIMBERSIDE	DURHILL



TYPICAL UTILITY WORK
(HIGH VOLUME TRAFFIC/*LOW VOLUME TRAFFIC)

N-S STREET	E-W STREET
LATMA CT	LATMA
KAPRI	LATMA
MARLIVE	LATMA
DURHILL	LATMA
ELMRIDGE	LATMA
CLOVERDALE	LATMA
TIMBERSIDE	CLOVERDALE
TIMBERSIDE	ELMRIDGE
LINKMEADOW	DURHILL
KAPRIL	MURWORTH
MARLIVE	MURWORTH
LINKMEADOW	MURWORTH
ILONA	DURHILL

SPACING FOR CHANNELIZING DEVICES

1. PLASTIC DRUMS ON MERGING TAPER @ 30' C–C– WITH CHEVRON SIGN @ 60' C–C AND TYPE 'C' WARNING LIGHT (FOR OVERNIGHT CLOSURE)
2. PLASTIC DRUMS ON DOWNSTREAM TAPE @ 35' C–C
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7. TUBULAR MARKER @ 20' C–C

NOTE: SPACING SHOWN ON TRAFFIC CONTROL PLANS SHALL SUPERSEDE THE ABOVE SPACINGS.

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CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

TRAFFIC CONTROL PLAN
PHASE 1 (WATER TYP. 2)
SHEET 4 OF 11

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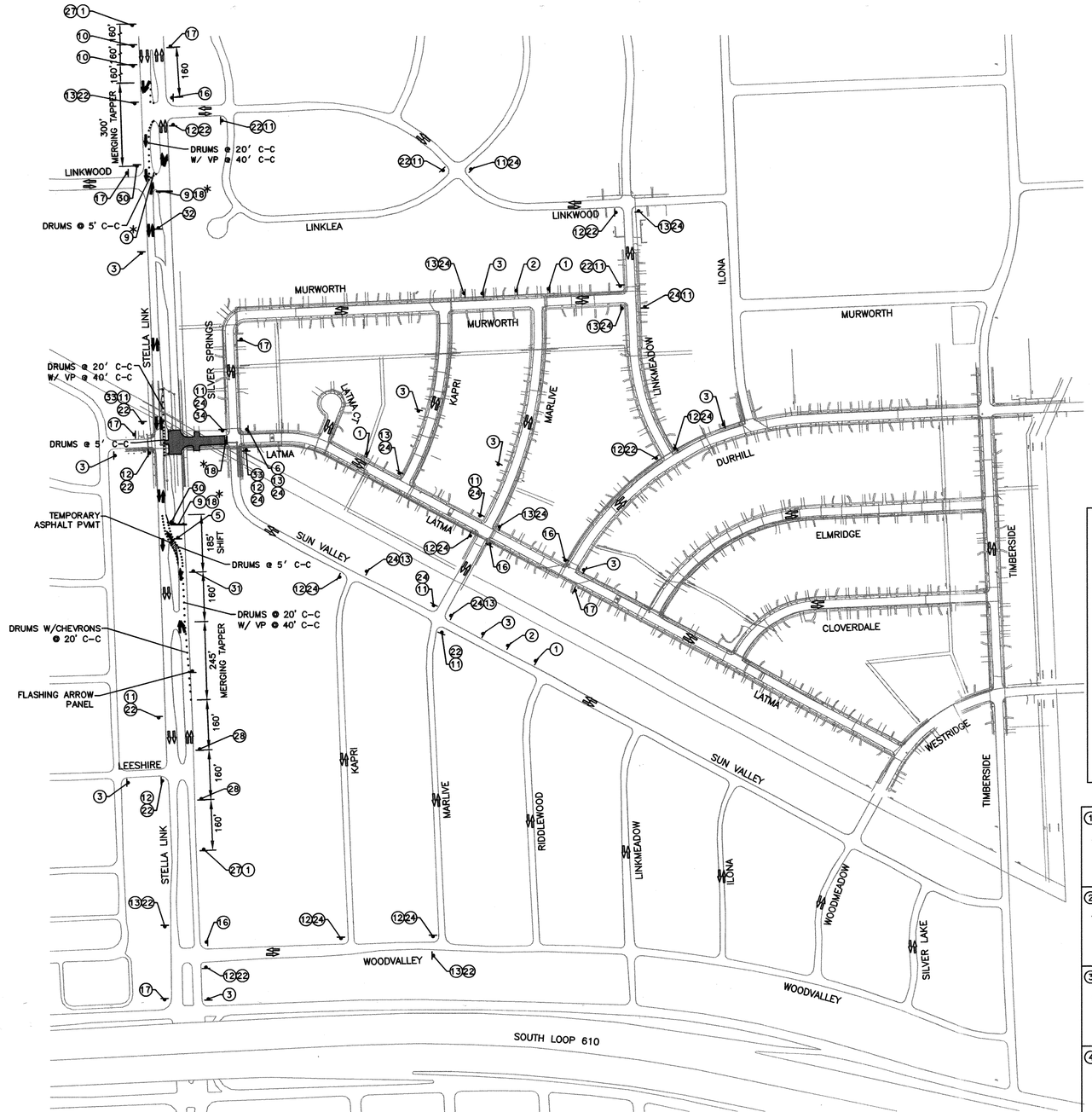
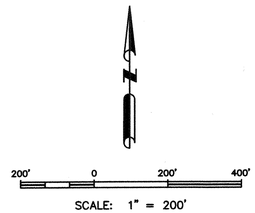


PHASE 2A DETOUR PLAN



LEGEND

- CONSTRUCTION AREA
- TYPE III BARRICADE
- EXISTING TRAFFIC LANE
- PROPOSED TRAFFIC LANE
- DRUMS OR CHEVRONS
- * ON TYPE III BARRICADE W/ 2 TYPE 'A' FLASHING LIGHTS

SPACING FOR CHANNELIZING DEVICES

1. PLASTIC DRUMS ON MERGING TAPER @ 30' C–C– WITH CHEVRON SIGN @ 60' C–C AND TYPE 'C' WARNING LIGHT (FOR OVERNIGHT CLOSURE)
2. PLASTIC DRUMS ON DOWNSTREAM TAPE @ 35' C–C
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7. TUBULAR MARKER @ 20' C–C

NOTE: SPACING SHOWN ON TRAFFIC CONTROL PLANS SHALL SUPERSEDE THE ABOVE SPACINGS.

1 ROAD WORK AHEAD CW21-4 (36X36 in)	6 ROAD CLOSED TO THRU TRAFFIC CR11-4 (60X30 in)	11 DETOUR CM4-9S (30X24 in)	16 END DETOUR M4-8A (24X18 in)	21 WEST CM3-3 (24X12 in)	26 ONE LANE ROAD AHEAD CW20-4 (36"X36")	31 CW1-3L (30"X30")
2 ROAD CLOSED AHEAD CW20-3D (36X36 in)	7 DETOUR CM4-10L (48X18 in)	12 DETOUR CM4-9R (30X24 in)	17 END ROAD WORK CG20-2A (36X24 in)	22 LATMA CW16-8 (18X12 in)	27 20 M.P.H. CW13-1 (24"X24")	32 CW1-3R (30"X30")
3 DETOUR AHEAD CW20-2 (36X36 in)	8 CW1-6a (30"X30")	13 DETOUR CM4-9L (30X24 in)	18 ROAD CLOSED CR11-2 (48X30 in)	23 SOUTH CM3-3 (24X12 in)	28 RIGHT LANE CLOSED AHEAD CW9-1R (36"X36")	33 NO LEFT TURN R3-2 (24"X24")
4 CW1-6a (30"X30")	9 DO NOT ENTER CR5-1 (30X30 in)	14 ONE WAY CR6-1R (36X12 in)	19 DETOUR CM4-8 (24X12 in)	24 STELLA LINK CW16-8 (18X12 in)	29 LANE ENDS MERGE LEFT CW9-2L (36"X36")	34 NO RIGHT TURN R3-1 (24"X24")
5 CM4-10L (48X18 in)	10 LEFT LANE CLOSED AHEAD CW9-1R (36"X36")	15 ONE WAY CR6-2L (36X12 in)	20 BEGIN ONE WAY R6-X1 (24" X 30")	25 EAST CM3-3 (24X12 in)	30 CW6-3 (30"X30")	

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TRAFFIC CONTROL PLAN
PHASE 2A
SHEET 5 OF 11

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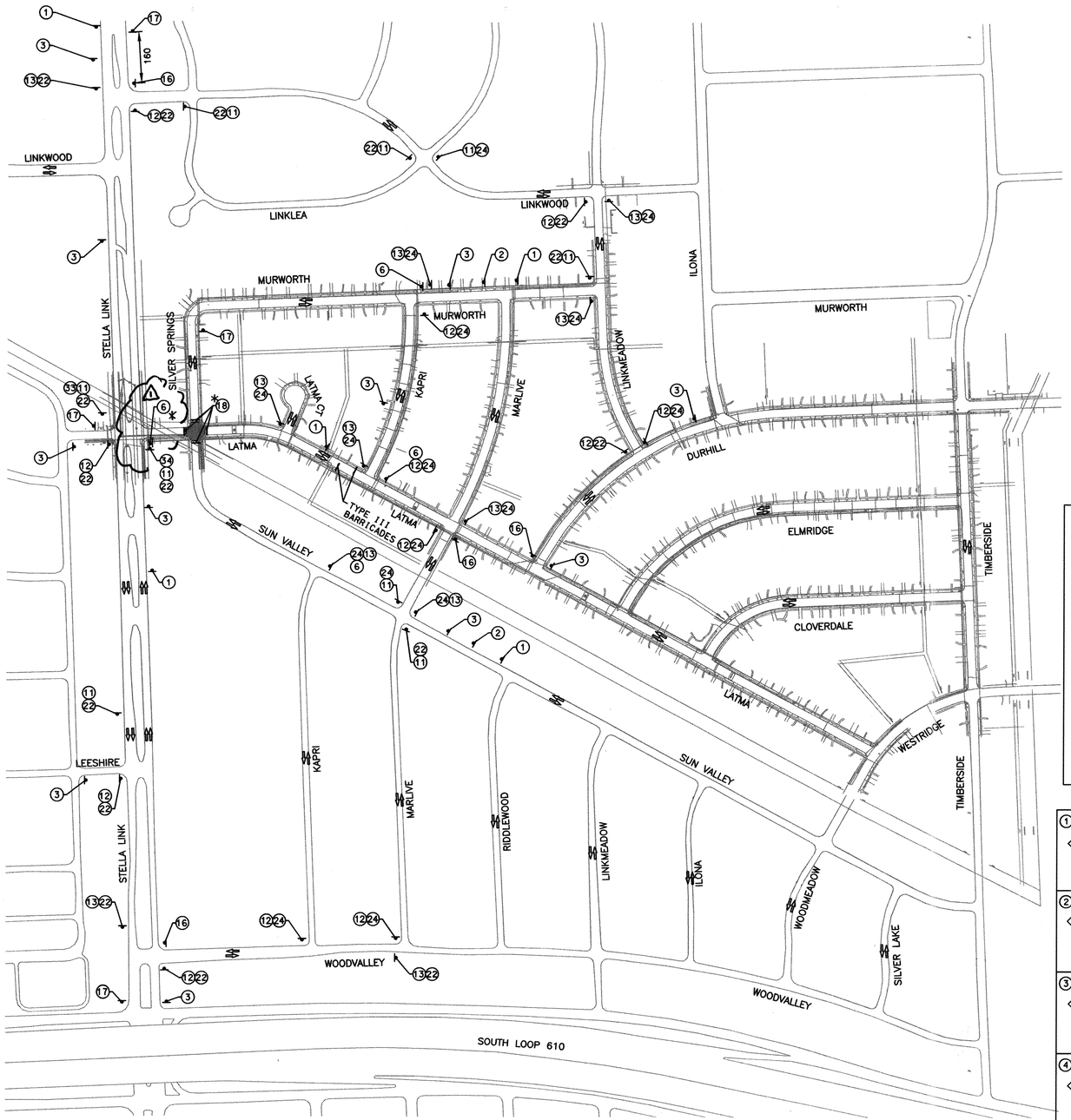
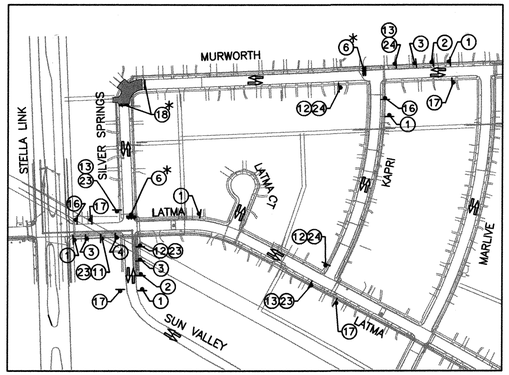


PHASE 2B DETOUR PLAN



PHASE 2C DETOUR PLAN

N

200' 0 200' 400'

SCALE: 1" = 200'

SPACING FOR CHANNELIZING DEVICES

1. PLASTIC DRUMS ON MERGING TAPER @ 30' C–C– WITH CHEVRON SIGN @ 60' C–C AND TYPE 'C' WARNING LIGHT (FOR OVERNIGHT CLOSURE)
2. PLASTIC DRUMS ON DOWNSTREAM TAPE @ 35' C–C
3. PLASTIC DRUMS ON RADII @ 5' C–C
4. PLASTIC DRUMS ON TANGENT @ 35' C–C WITH VERTICAL PANEL @ 70' C–C AND TYPE 'C' WARNING LIGHT @ 70' C–C (FOR OVERNIGHT CLOSURE)
5. PLASTIC DRUMS IN FRONT OF CONSTRUCTION ZONE @ 20' C–C WITH VERTICAL PANEL @ 40' C–C AND TYPE 'A' WARNING LIGHT @ 40' C–C (FOR OVERNIGHT CLOSURE)
6. CONCRETE TRAFFIC BARRIER (ctb) OR LOW PROFILE CONCRETE TRAFFIC BARRIER (LPCTB) WITH REFLECTORS @ 10' C–C IF PAVEMENT DROP IS MORE THAN TWELVE INCHES (12")
7. TUBULAR MARKER @ 20' C–C

NOTE: SPACING SHOWN ON TRAFFIC CONTROL PLANS SHALL SUPERSEDE THE ABOVE SPACINGS.

1 ROAD WORK AHEAD CW21-4 (36X36 in)	6 ROAD CLOSED TO THRU TRAFFIC CR11-4 (60X30 in)	11 DETOUR CM4-9S (30X24 in)	16 END DETOUR M4-8A (24X18 in)	21 WEST CM3-3 (24X12 in)	26 ONE LANE ROAD AHEAD CW20-4 (36"X36")	31 CW1-3L (30"X30")
2 ROAD CLOSED AHEAD CW20-3D (36X36 in)	7 DETOUR CM4-10L (48X18 in)	12 DETOUR CM4-9R (30X24 in)	17 END ROAD WORK CG20-2A (36X24 in)	22 LATMA CW16-8 (18X12 in)	27 20 M.P.H. CW13-1 (24"X24")	32 CW1-3R (30"X30")
3 DETOUR AHEAD CW20-2 (36X36 in)	8 CW1-6a (30"X30")	13 DETOUR CM4-9L (30X24 in)	18 ROAD CLOSED CR11-2 (48X30 in)	23 SOUTH CM3-3 (24X12 in)	28 RIGHT LANE CLOSED AHEAD CW9-1R (36"X36")	33 NO LEFT TURN R3-2 (24"X24")
4 CW1-6a (30"X30")	9 DO NOT ENTER CR5-1 (30X30 in)	14 ONE WAY CR6-1R (36X12 in)	19 DETOUR CM4-8 (24X12 in)	24 STELLA LINK CW16-8 (18X12 in)	29 LANE ENDS MERGE LEFT CW9-2L (36"X36")	34 NO RIGHT TURN R3-1 (24"X24")
5 CM4-10L (48X18 in)	10 LEFT LANE CLOSED AHEAD CW9-1R (36"X36")	15 ONE WAY CR6-2L (36X12 in)	20 BEGIN ONE WAY R6-X1 (24" X 30")	25 EAST CM3-3 (24X12 in)	30 CW6-3 (30"X30")	

LEGEND

- CONSTRUCTION AREA
- TYPE III BARRICADE
- EXISTING TRAFFIC LANE
- PROPOSED TRAFFIC LANE
- DRUMS OR CHEVRONS
- * ON TYPE III BARRICADE W/ 2 TYPE 'A' FLASHING LIGHTS

MK.	DESCRIPTION	DATE	DWN.	CHK.
1	ADDED TYPE III BAR. (1/30/12 DP)			DWG

REVISIONS

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SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

STATE OF TEXAS — VINCENT N. JACOB — 98325 — LICENSED PROFESSIONAL ENGINEER — Vincent N Jacob — 01/06/12

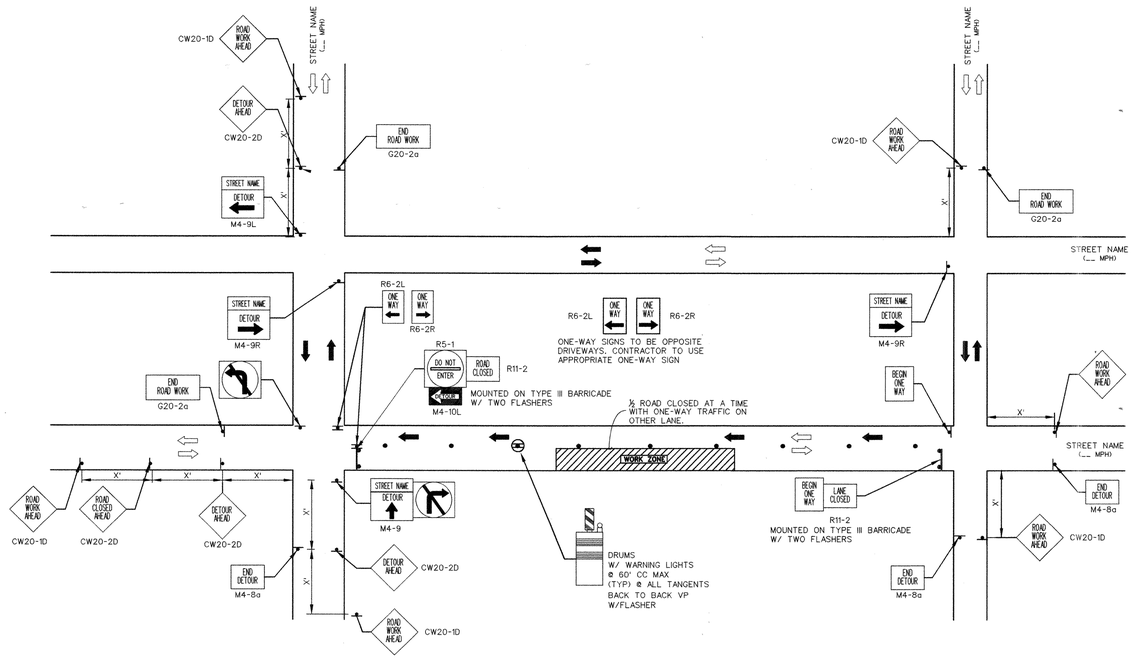
Job No.: 09-051	Dwn By: BD/DS
Date: November 2011	Chkd By: V. Jacob

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

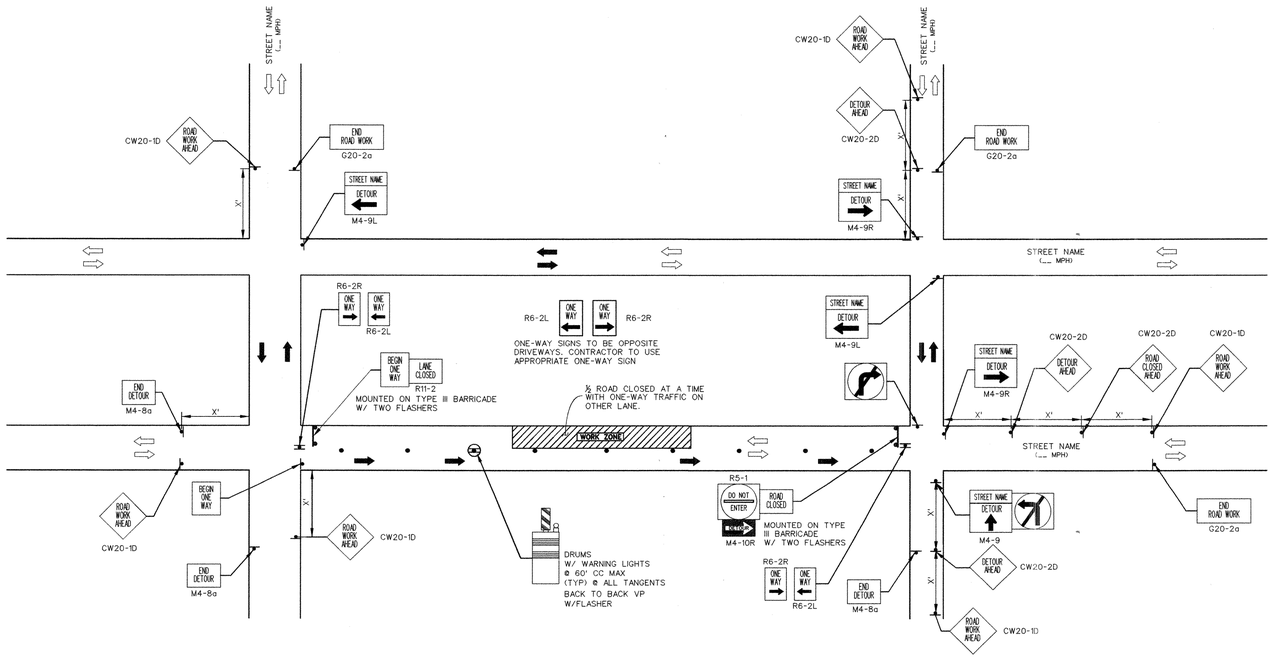
City of Houston
Neighborhood Street Reconstruction
Project NSR 446A
TRAFFIC CONTROL PLAN
PHASE 2B, 2C
SHEET 6 OF 11

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	
DRAWING SCALE	
1" = 200'	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	
SHEET No: 85 OF 122	

PUBLIC WORKS AND ENGINEERING — EXAMINED AND FILED — 48978 NUMBER



TYPICAL NEIGHBORHOOD STREET DETOUR - EAST/NORTH BOUND



TYPICAL NEIGHBORHOOD STREET DETOUR - WEST/SOUTH BOUND

NOTE:

1. A 10' MINIMUM WIDTH EMERGENCY LANE SHALL BE MADE AVAILABLE AND MAINTAINED BY THE CONTRACTOR AT ALL TIMES.
2. ALL FLASHERS TO CONFORM TO MUTCD BY USE AND TYPE

LEGEND

- TYPE III BARRICADE
- AREA UNDER CONSTRUCTION
- EXISTING TRAVELWAY
- TRAFFIC CONTROL PLAN DETOUR TRAVEL WAY

MK.	DESCRIPTION	DATE	DWN.	CHK.

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01/06/12

Job No.: 09-051	Dwn By: BD/DS
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CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A
TRAFFIC CONTROL PLAN
PHASES 2,3,4 (TYPICAL 1)
SHEET 7 OF 11

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MARK BOARD, P.E.	
SHEET No: 86 OF 122	

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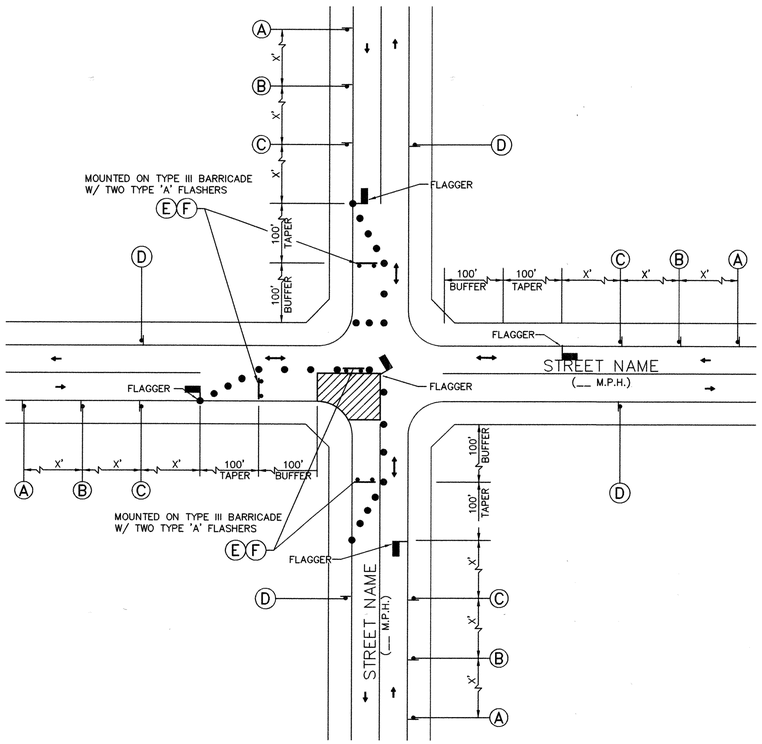
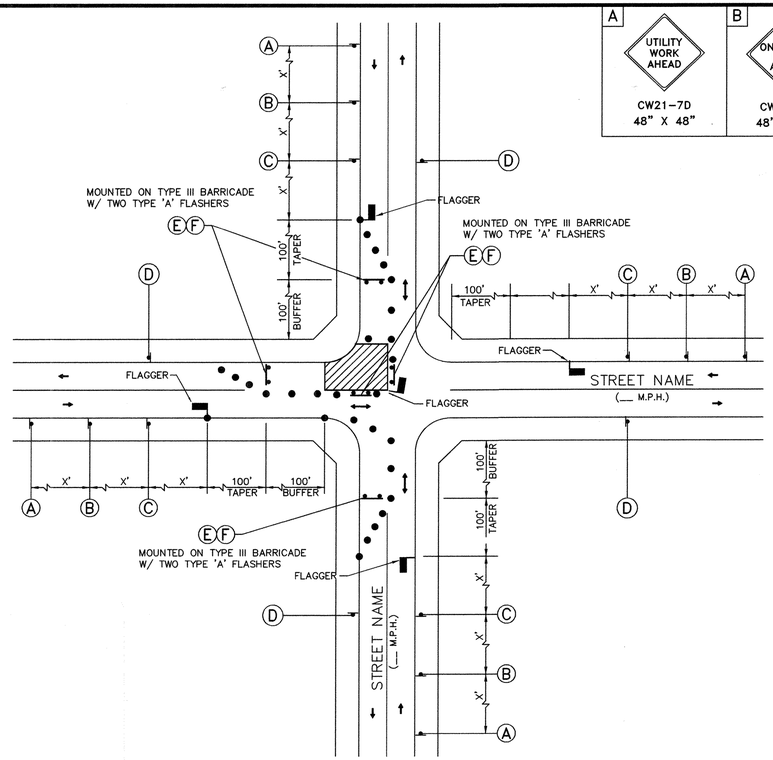
MB





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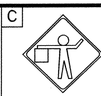
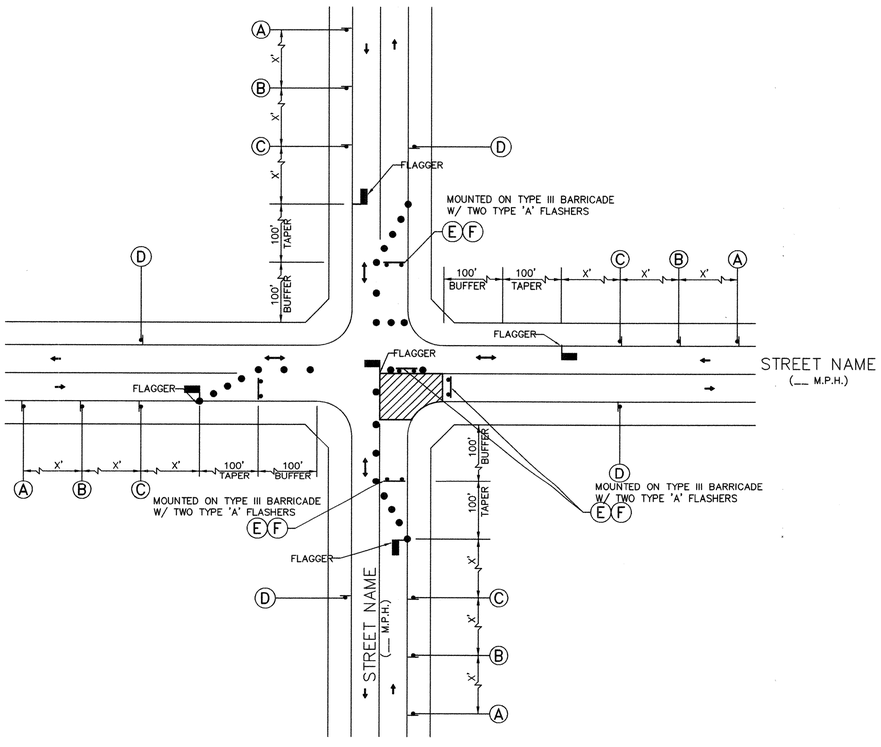
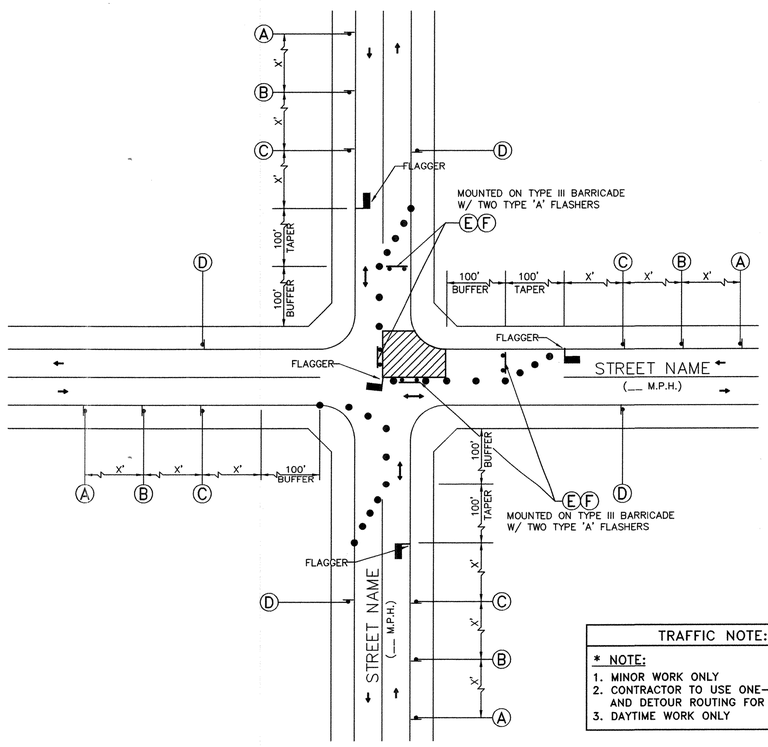
UTILITY WORK AHEAD CW21-7D 48" X 48"	ONE LANE ROAD AHEAD CW20-4D 48" X 48"	 CW20-7a 36" X 36"	END ROAD WORK G20-2a 48" X 24"
E	F		
DO NOT ENTER R5-1 48" X 48"	ROAD CLOSED R11-2 48" X 30"		





TRAFFIC NOTE:

* NOTE:
1. MINOR WORK ONLY
2. CONTRACTOR TO USE ONE-LANE ROAD CLOSURE AND DETOUR ROUTING FOR MAJOR OPERATIONS
3. DAYTIME WORK ONLY

MK.	DESCRIPTION	DATE	DWN.	CHK.

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STATE OF TEXAS
VINCENT N. JACOB
98325
LICENSED
PROFESSIONAL ENGINEER
Vincent N. Jacob
01/06/12

Job No.: 09-051 | Dwn By: BD/DS
Date: November 2011 | Chkd By: V. Jacob

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

TRAFFIC CONTROL PLAN
PHASES 2,3,4 (TYPICAL 2)
SHEET 8 OF 11

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ACCEPTED AND FILED
48978
NUMBER
TEXAS

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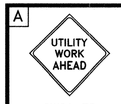
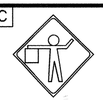
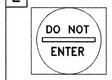
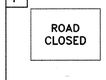
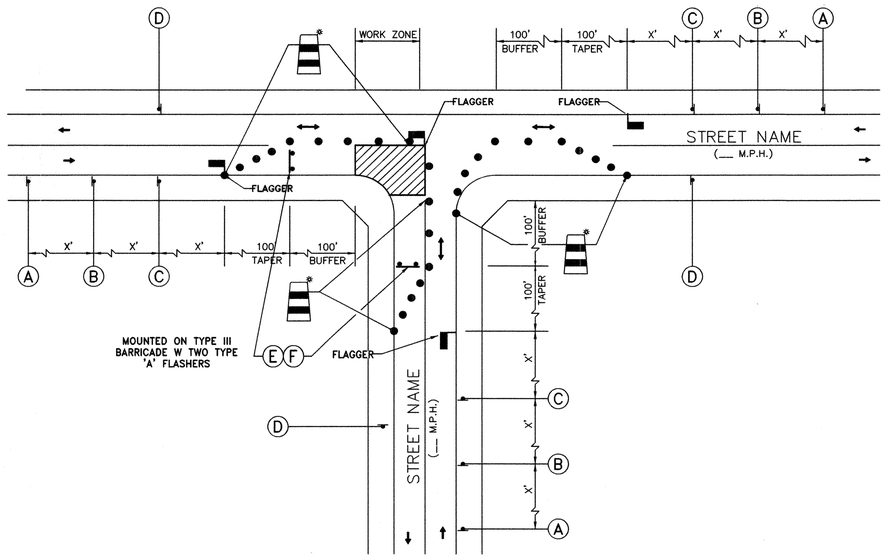
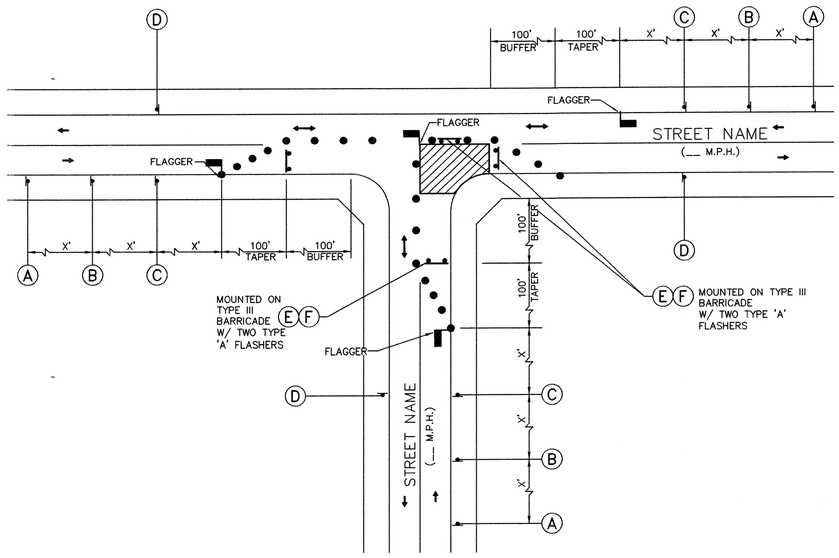
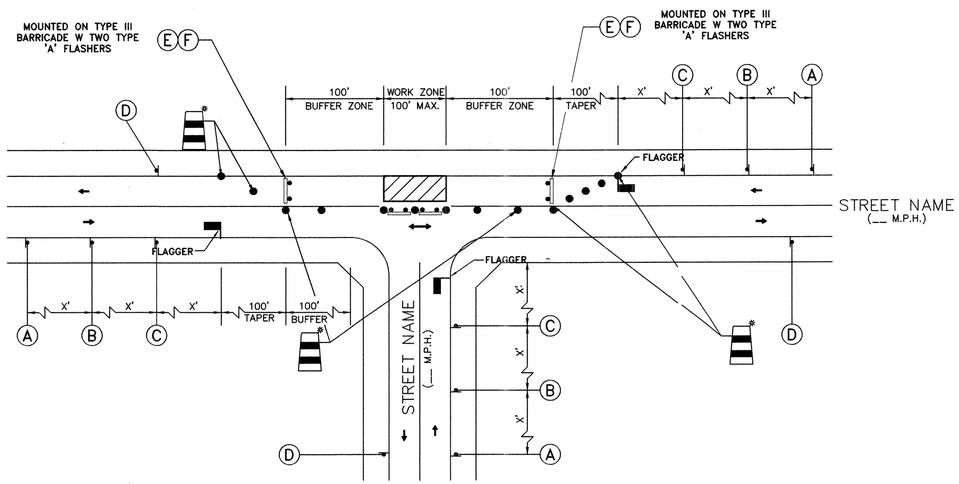
					
CW21-7D 48" X 48"	CW20-4D 48" X 48"	CW20-7a 36" X 36"	G20-2a 48" X 24"	R5-1 48" X 48"	R11-2 48" X 30"





LEGEND

- SIGN
- FLAGGER
- APPROVED CHANNELIZATION DEVICE
- TRAFFIC FLOW
- BARRICADE



TRAFFIC NOTE:

* NOTE:

1. MINOR WORK ONLY
2. CONTRACTOR TO USE ONE-LANE ROAD CLOSURE AND DETOUR ROUTING FOR MAJOR OPERATIONS
3. DAYTIME WORK ONLY

mb

MK.	DESCRIPTION	DATE	DWN.	CHK.

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FB NO. PB#5543

STATE OF TEXAS — VINCENT N. JACOB — 98325 — LICENSED PROFESSIONAL ENGINEER
Vincent N. Jacob 01/06/12

Job No.: 09-051	Dwn By: BD/DS
Date: November 2011	Chkd By: V. Jacob

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

TRAFFIC CONTROL PLAN
PHASES 2,3,4 (TYPICAL 3)
SHEET 9 OF 11

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	PUBLIC WORKS AND ENGINEERING — REVIEWED AND FILED — 48978 — NUMBER — TEXAS
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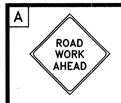
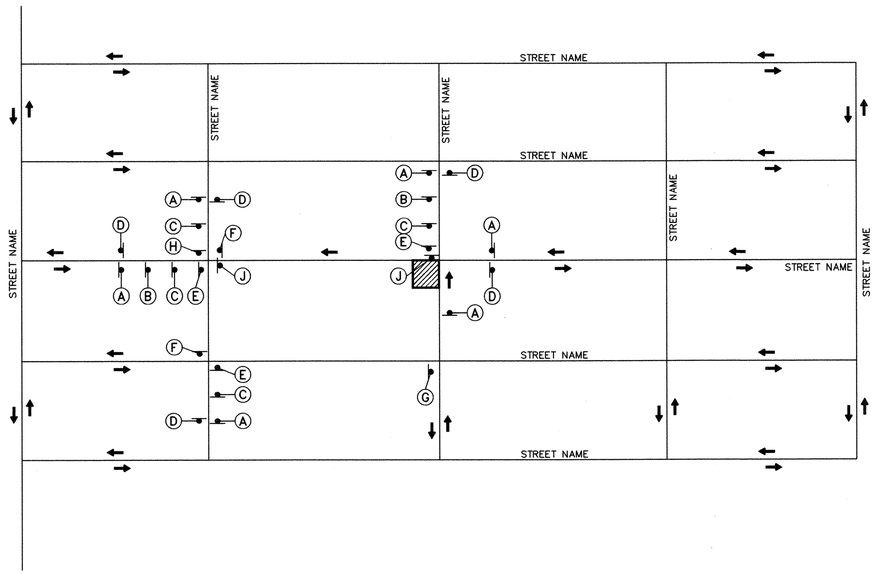
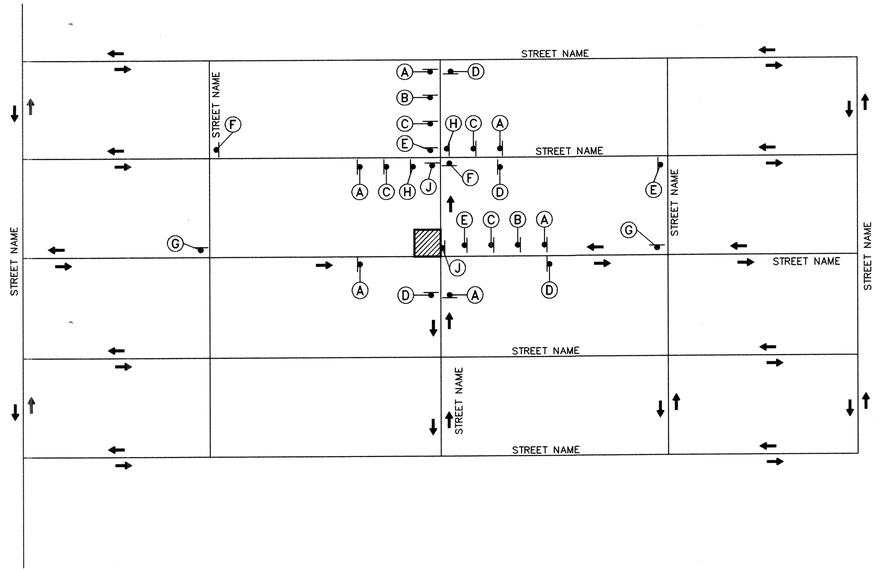
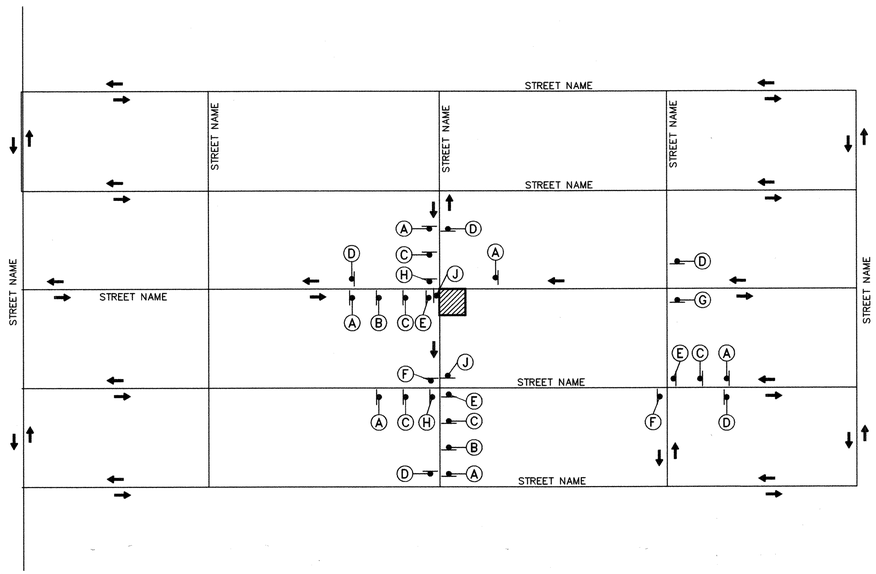
								
CW20-1D 48" X 48"	CW20-4D 48" X 48"	CW20-2D 36" X 36"	G20-2a 48" X 24"	M4-9R	M4-9L	M4-8A 48" X 24"	M4-9	R11-4 60" X 30"

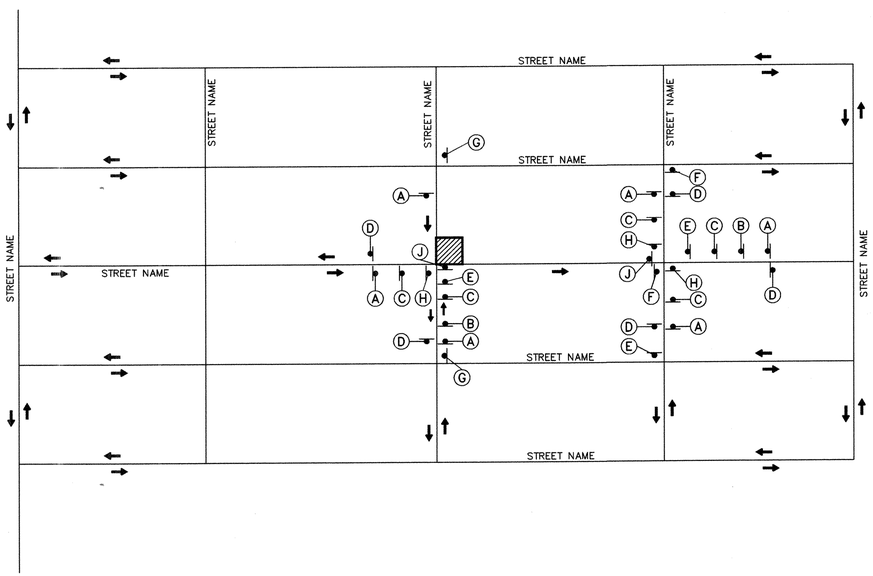




LEGEND

- SIGN
- TRAFFIC FLOW
- WORK ZONE





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STATE OF TEXAS
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LICENSED
PROFESSIONAL ENGINEER
01/06/12

Job No.: 09-051	Dwn By: BD/DS
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CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A
TRAFFIC CONTROL PLAN
PHASES 2,3,4 (TYPICAL 4)
SHEET 10 OF 11

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DRAWING SCALE	
N.T.S.	
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48978
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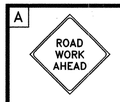
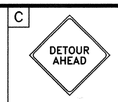
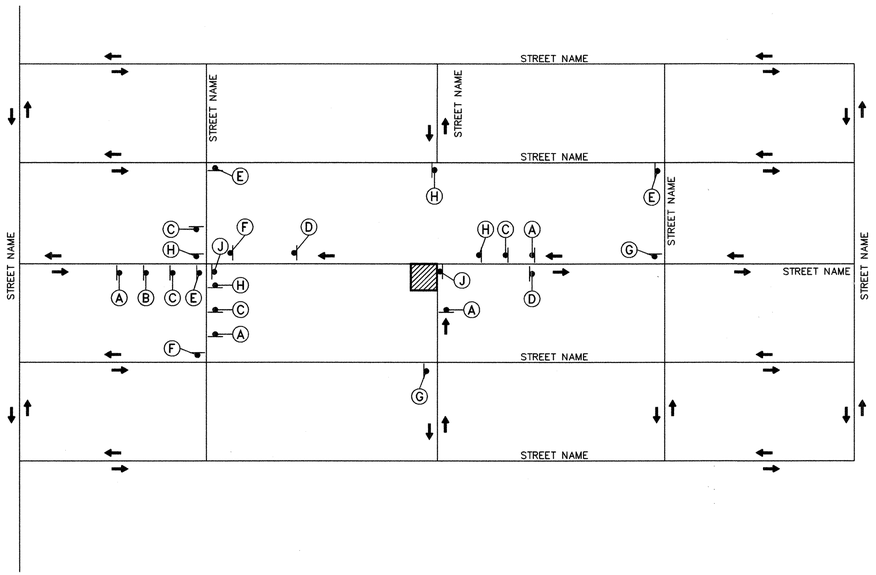
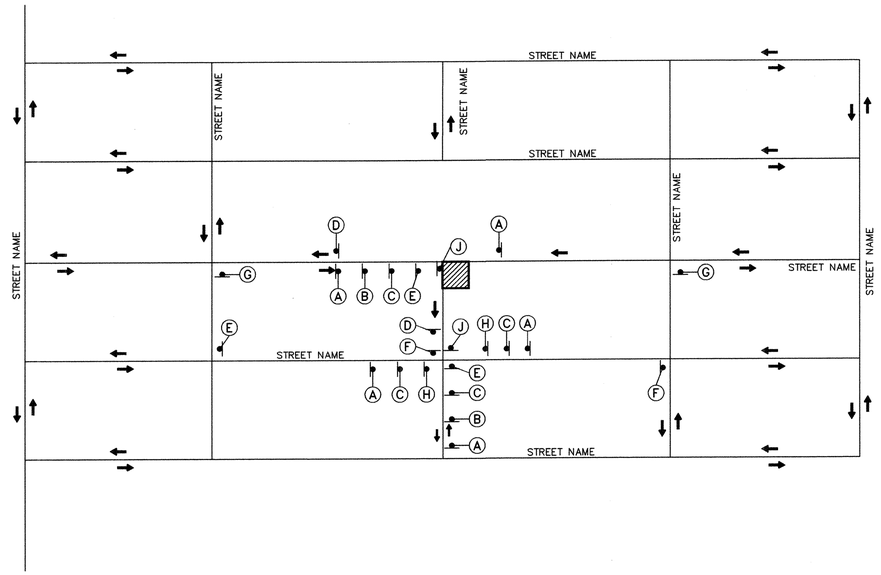
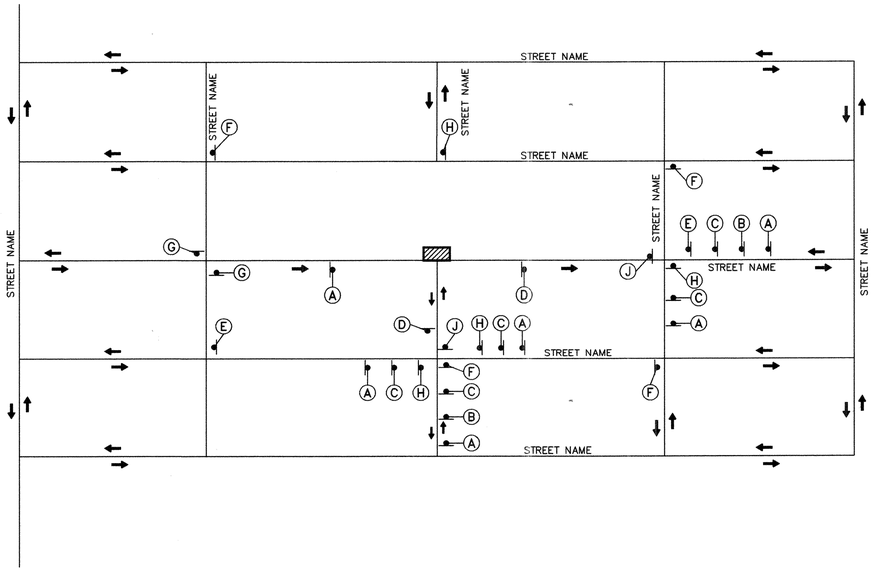
								
CW20-1D 48" X 48"	CW20-4D 48" X 48"	CW20-2D 36" X 36"	G20-2a 48" X 24"	M4-9R	M4-9L	M4-8A 48" X 24"	M4-9	R11-4 60" X 30"

LEGEND

- SIGN
- TRAFFIC FLOW
- WORK ZONE







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STATE OF TEXAS
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FB NO. PB#5543

Job No.: 09-051 | Dwn By: BD/DS

Date: November 2011 | Chkd By: V. Jacob

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A
TRAFFIC CONTROL PLAN
PHASES 2,3,4 (TYPICAL 5)
SHEET 11 OF 11

WBS NO.	FOR CITY OF HOUSTON USE ONLY
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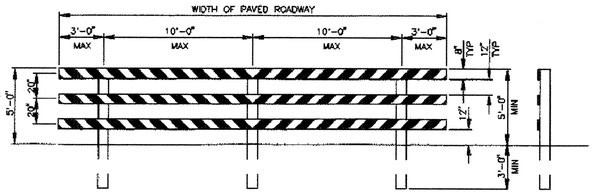
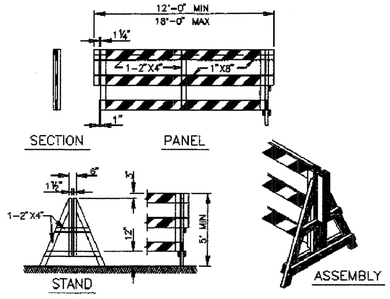
NUMBER



TYPE III BARRICADE
FOR END OF ROAD

FOR TYPE III BARRICADE FOR END OF ROAD, THE THREE (3) RAILS SHALL BE REFLECTIVE RED AND REFLECTIVE WHITE STRIPES ON SIDE FACING TRAFFIC



DEMOUNTABLE TYPE III BARRICADE

BARRICADE NOTES

THE MOST RECENT EDITION OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, AND IT'S REVISIONS, SHALL GOVERN THE CONSTRUCTION AND USE OF ALL ITEMS HEREIN DESCRIBED.

CHANNELIZATION DEVICES OTHER THAN BARRICADES SHOULD NORMALLY BE USED FOR CHANNELIZATION PURPOSES.

BARRICADES SHOULD NORMALLY BE PLACED PERPENDICULAR TO THE TRAFFIC FLOW. OTHER CHANNELIZING DEVICES, SUCH AS DRUMS, VERTICAL PANELS OR PORTABLE BARRIERS, SHOULD BE USED WHERE NEEDED TO SEPARATE TRAFFIC FROM THE WORK AREA. IN ALL CASES, THE BARRICADES SHOULD BE SO LOCATED AS TO MOST ADVANTAGEOUSLY WARN AND DIRECT TRAFFIC.

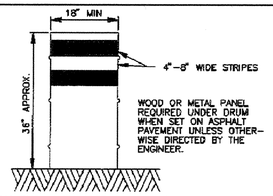
BARRICADES MAY BE DESIGNED AND CONSTRUCTED FROM WOOD OR ANY OTHER SUITABLE MATERIAL IN A MANNER APPROVED BY THE DEPARTMENT OF TRAFFIC AND TRANSPORTATION. THE CONSTRUCTION DETAILS SHOWN HEREON ARE TYPICAL AND ARE SUGGESTED DETAILS FOR WOOD SUPPORT SYSTEMS FOR BARRICADES. THE DETAILS OF RAIL WIDTH AND STRIPING, NUMBER AND SPACING OF RAILS, MINIMUM LENGTH AND HEIGHT (ABOVE PAVEMENT) OF RAILS MUST BE ADHERED TO WHEN ALTERNATE DESIGNS ARE USED.

BARRICADES ARE TO BE CONSTRUCTED OF CLEAN SOUND MATERIAL. ALL SURFACES ABOVE GROUND, WHICH ARE NOT STRIPED, SHALL BE WHITE EXCEPT THE UNPAINTED GALVANIZED METAL OR ALUMINUM COMPONENTS MAY BE USED. COMPONENTS MADE OF LUMBER SHALL BE PAINTED WITH A MINIMUM OF TWO COATS OF AN APPROVED BRAND OF WHITE PAINT TO SECURE THOROUGH COVERAGE AND A UNIFORM WHITE COLOR.

THE REFLECTORIZED WHITE AND REFLECTORIZED ORANGE (REFLECTORIZED RED) STRIPES FOR BARRICADES, DRUMS AND VERTICAL PANELS SHALL BE CONSTRUCTED OF HIGH INTESITY SHEETING AND SHALL BE MAINTAINED TO MEET THE APPEARANCE, COLOR AND REFLECTIVITY REQUIREMENTS SET BY DOTT.

THE CONTRACTOR SHALL MAINTAIN EACH BARRICADE IN A CLEAN AND GOOD CONDITION.

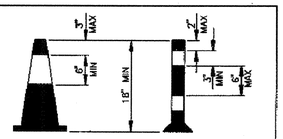
BARRICADES SHALL BE REMOVED UPON COMPLETION OF THE WORK AND/OR THE ELIMINATION OF THE HAZARD ON ANY SECTION.



DRUMS

DRUMS, SET ON END, AND USED FOR TRAFFIC WARNING OR CHANNELIZATION SHALL BE APPROX 36" IN HEIGHT AND A MIN OF 18" IN DIAMETER. THE CONTRACTOR, AT HIS OPTION, MAY USE DRUMS MADE FROM STEEL BARRELS OR BLACK POLYETHYLENE PLASTIC DRUM LINERS WEIGHING APPROX EIGHT POUNDS EACH. THE MARKINGS ON DRUMS SHALL BE HORIZONTAL, CIRCUMFERENTIAL, REFLECTORIZED ORANGE AND REFLECTORIZED WHITE STRIPES, 4 TO 8 INCHES WIDE. THE FIRST REFLECTORIZED STRIPE SHOULD START WITHIN TWO (2) INCHES OF THE TOP OF THE DRUM. THERE SHALL BE AT LEAST TWO ORANGE AND TWO WHITE STRIPES ON EACH DRUM. IF THERE ARE NON-REFLECTORIZED SPACES BETWEEN THE HORIZONTAL ORANGE AND WHITE STRIPES, THEY SHALL BE NO MORE THAN 2 INCHES WIDE. METAL DRUMS SHALL BE PAINTED BLACK OR ORANGE BEFORE REFLECTORIZED STRIPES ARE ADDED. ALL DRUMS ON PROJECT WILL BE THE SAME COLOR. WHEN DRUMS ARE PLACED IN THE ROADWAY, APPROPIATE WARNING SIGNS SHOULD BE USED. DURING HOURS OF DARKNESS, A FLASHING WARNING LIGHT SHOULD BE PLACED ON DRUMS USED SINGLY AS A WARNING DEVICE. STEADY BURN ELECTRIC LIGHTS OR DELINEATORS SHOULD BE PLACED ON DRUMS USED IN SERIES FOR TRAFFIC CHANNELIZATION. DRUMS SHALL BE WEIGHTED WITH SAND TO THE EXTENT INDICATED IN THE PLANS.

CWI-8 CHEVRON SIGNS, CWI-6A ARROW SIGNS OR VP-1 VERTICAL PANELS MOUNTED ABOVE DRUMS MAY BE USED AS SUPPLEMENTS TO DRUM DELINEATION.

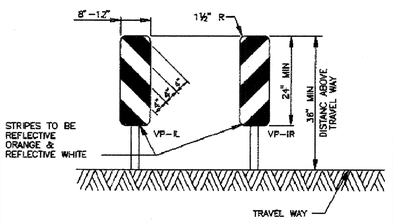


CONES

TRAFFIC CONES AND TUBULAR MARKERS SHALL BE A MIN OF 18" INCHES IN HEIGHT WITH A BROADENED BASE AND MAY BE MADE OF VARIOUS MATERIALS TO WITHSTAND IMPACT WITHOUT DAMAGE TO THEMSELVES OR TO VEHICLES. LARGER SIZES SHOULD BE USED ON FREEWAYS AND OTHER ROADWAYS WHERE SPEED ARE RELATIVELY HIGH OR WHERE EVER MORE CONSPICUOUS GUIDANCE IS NEEDED. ORANGE SHALL BE THE PREDOMINANT COLOR ON CONES AND TUBULAR MARKERS. THEY SHOULD BE KEPT CLEAN AND BRIGHT FOR MAX TARGET VALUE. FOR NIGHTTIME USE THEY SHALL BE REFLECTORIZED OR EQUIPPED WITH LIGHTING DEVICES FOR MAX VISIBILITY. REFLECTORIZED MATERIAL SHALL HAVE A SMOOTH, SEALED OUTER SURFACE WHICH WILL DISPLAY THE SAME APPROX COLOR DAY AND NIGHT.

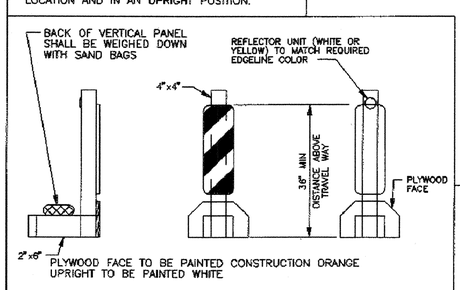
REFLECTORIZATION OF TUBULAR MARKERS SHALL BE A MIN OF TWO THREE-INCH BANDS PLACED A MAX OF 2" FROM THE TOP WITH A MAX OF 6" BETWEEN THE BANDS. REFLECTORIZATION OF CONES SHALL BE PROVIDED BY A MIN 6" BAND PLACED A MAX OF 3" FROM THE TOP.

CONES OR TUBULAR MARKERS ARE GENERALLY ONLY SUITABLE FOR TEMPORARY USAGE (UP TO 8 HOURS) WITH OTHER CHANNELIZATION DEVICES SUCH AS VERTICAL PANELS OR BARRICADES PREFERRED FOR LONGER TERM USAGE. CARE SHOULD BE TAKEN TO INSURE THAT THEY REMAIN IN THEIR PROPER LOCATION AND IN AN UPRIGHT POSITION.



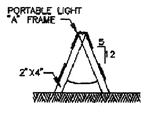
VERTICAL PANELS (VP)

VERTICAL PANELS ARE NORMALLY USED AS CHANNELIZING DEVICES TO INDICATE TANGENT OR NEARLY TANGENT ROADWAY ALIGNMENT WHERE GOOD TARGET VALUE OF A DEVICE IS NEEDED IN DAYTIME AS WELL AS THE NIGHTTIME. IN ADDITION, VERTICAL PANELS SHOULD BE USED AT THE EDGE OF SHOULDER DROP-OFFS AND OTHER SUCH AREAS AS LANE TRANSITIONS WHERE POSITIVE DAY AND NIGHT DELINEATION MAY BE REQUIRED. VERTICAL PANELS SHOULD BE MOUNTED BACK TO BACK IF USED AT THE EDGE OF CUTS ADJACENT TO TWO-WAY TWO LANE ROADWAYS. STRIPES SHOULD ALWAYS SLOPE DOWNWARD TOWARD THE TRAVELED WAY.

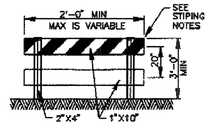


TYPICAL PORTABLE VERTICAL PANEL
OR DELINEATOR

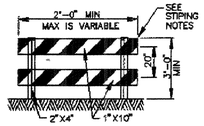
OTHER SIMILAR SUPPORTS MAY BE USED WHEN APPROVED OR DIRECTED BY THE COH DEPT OF TRAFFIC AND TRANSPORTATION



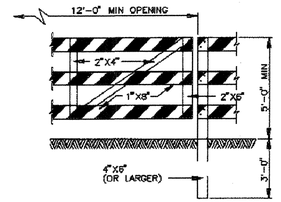
"A" FRAME



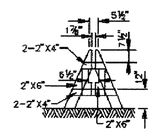
TYPE I



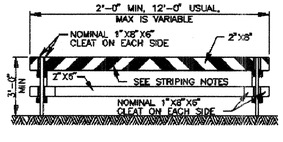
TYPE II



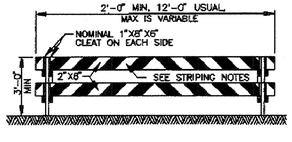
GATE FOR
TYPE III BARRICADE



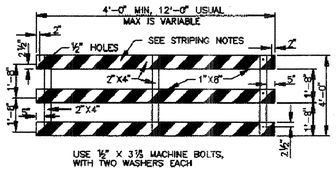
DEMOUNTABLE



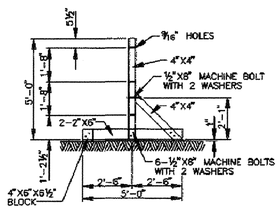
TYPE I



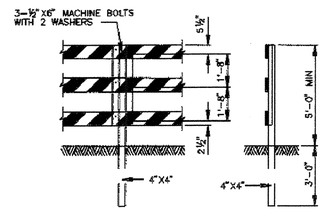
TYPE II



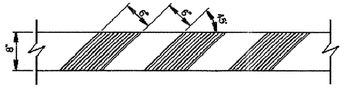
PANEL FOR
TYPE III BARRICADE



STAND FOR
TYPE III BARRICADE



POST FOR
TYPE III BARRICADE



STRIPING FOR BARRICADE

FOR ALL TYPES OF BARRICADES WITH RAILS LESS THAN 3'-0" LONG, STRIPES 4" WIDE SHALL BE USED. IDENTIFICATION MARKINGS MAY BE SHOWN ONLY ON BACK SIDE OF BARRICADE RAILS.

STRIPING SHOULD COVER THE FULL WIDTH OF THE RAIL. STRIPING OF RAILS, PANELS, ETC. SHOULD SLOPE DOWNWARD AT AN ANGLE OF 45 DEGREES IN DIRECTIONS TRAFFIC IS TO PASS.

WHERE A BARRICADE EXTENDS ENTIRELY ACROSS A ROADWAY, IT IS DESIRABLE THAT THE STRIPES SLOPE DOWNWARD IN THE DIRECTION TOWARD WHICH TRAFFIC MUST TURN IN DETOURING. WHEN BOTH RIGHT AND LEFT TURNS ARE PROVIDED FOR, THE CHEVRON STRIPING MAY SLOPE DOWNWARD IN BOTH DIRECTIONS FROM THE CENTER OF THE BARRICADE.

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

BARRICADE STANDARD

(NOT TO SCALE)

APPROVED BY:	APPROVED BY:
CITY ENGINEER	DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: OCT-01-2002	DWG NO: 01580-01

MK.	DESCRIPTION	DATE	DWN.	CHK.

REVISIONS

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(713) 622-9264 • Fax (713) 622-9265 • www.hdrinc.com
HDR Engineering Inc. Texas Reg. No. F-754

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TEL (713) 747-2399 FAX (713) 748-3748
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SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

STATE OF TEXAS · VINCENT N. JACOB · 98325 · LICENSED PROFESSIONAL ENGINEER · 01/06/12

Job No.: 09-051	Dwn By: BD/DS
Date: November 2011	Chkd By: V. Jacob

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

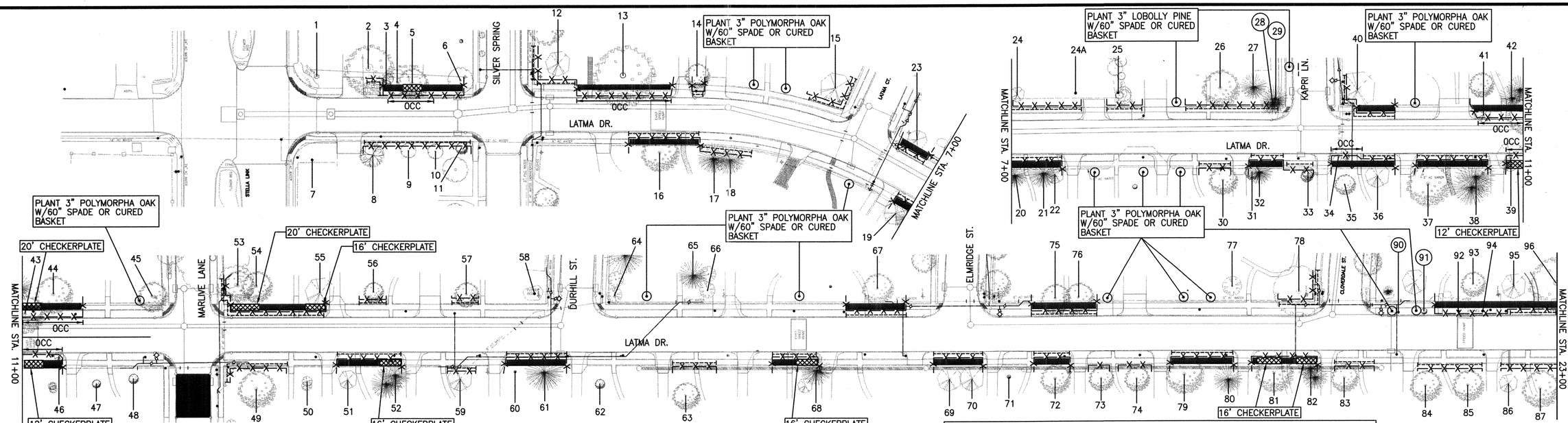
City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

TRAFFIC CONTROL PLAN
BARRICADE STANDARDS

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	
DRAWING SCALE	
N.T.S.	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	
SHEET No: 91 OF 122	

PUBLIC WORKS AND ENGINEERING · REVIEWED AND FILED · 48978 · LICENSE NUMBER · TEXAS

NB



Tree No.	Location	Description	Comments	Treatment
Trees on Latma Drive				
1	9018 Silver Springs	2" Redbud	Private tree, will not be impacted	
2	9018 Silver Springs	50" Tallow	Private tree	Root prune for storm plug, Fence, Clearance prune
3	9018 Silver Springs	8" Ligustrum	Not ordinance tree	Clearance prune
4	9018 Silver Springs	8" Ligustrum	Not ordinance tree	Clearance prune
5	9018 Silver Springs	24" Live Oak	Ordinance tree	20' checkerplate, Zero curb cutback, Demo-Form-Pour sidewalk without damage to roots > 1", Fence, Clearance prune
6	9018 Silver Springs	18" Arborvitae	Not ordinance tree	Root prune for sidewalk, Fence, Clearance prune
7	Not available	18" Camphor	Private tree	Clearance prune
8	Not available	15" Tallow	Private tree	Root prune for sidewalk, Fence, Clearance prune
9	Not available	9" Pecan	Ordinance tree	Root prune for sidewalk, Fence, Clearance prune
10	Not available	7" Pecan	Ordinance tree	Root prune for sidewalk, Fence, Clearance prune
11	Not available	9" Water Oak	Ordinance tree	Root prune for sidewalk, Fence, Clearance prune
12	3824 Latma	11" Magnolia	Private tree	Root prune for sidewalk, Fence, Clearance prune
13	3824 Latma	53" Live Oak	15% dieback, Ordinance tree	Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
14	3820 Latma	15" Live Oak	20% dieback, Ordinance tree	Root prune for sidewalk, Fence, Clearance prune
15	3820 Latma	19" Magnolia	40% dieback, Private tree	Root prune for sidewalk, Fence, Clearance prune
16	3819 Latma	25" Water Oak	Ordinance tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
17	3819 Latma	19" Pine	Private tree	Root prune for sidewalk, Fence
18	3819 Latma	15" Pine	Private tree	Root prune for sidewalk, Fence
19	3811 Latma	12" Magnolia	20% dieback, Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
20	3811 Latma	17" Pine	Ordinance tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
21	3811 Latma	19" Pine	Ordinance tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
22	3811 Latma	13" Magnolia	Ordinance tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
23	9005 Latma Ct	12" Magnolia	20% dieback, Ordinance tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
24	9005 Latma Ct	8" Magnolia	Private tree	Fence, Root prune for sidewalk
24A	9005 Latma Ct	22" Catalpa	30% dieback, Private tree	Fence, Root prune for sidewalk
25	3802 Latma	11" Live Oak	Private tree	Root prune for sidewalk, Fence, Clearance prune
26	3802 Latma	25" Water Oak	Private tree	Root prune for sidewalk, Fence, Clearance prune
27	3802 Latma	10" Pine	Private tree	Fence, Root prune for sidewalk
28	3802 Latma	13" Pine	Ordinance tree, Remove for wheel chair ramp	Remove tree, Provide 13" replacement to comply with ordinance
29	3802 Latma	10" Pine	Ordinance tree, Remove for wheel chair ramp	Remove tree, Provide 10" replacement to comply with ordinance
30	Not available	17" Live Oak	Private tree	Fence, Root prune for sidewalk
31	3729 Latma	10" Water Oak	Ordinance tree	16' checkerplate, Root prune for street, Demo-Form-Pour sidewalk without damage to roots > 1", Fence, Clearance prune
32	3729 Latma	17" Pine	Ordinance tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
33	3729 Latma	9" Green Ash	Ordinance tree	Root prune for sidewalk, Fence, Clearance prune
34	3735 Latma	10" Water Oak	Ordinance tree	Hand dig for cut&plug and TS&V, Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots >1", Clearance prune, Root stimulate
35	3735 Latma	18" Water Oak	Private tree	Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
36	3735 Latma	(2)14" Magnolia	30% dieback, Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
37	3731 Latma	36" Live Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
38	3731 Latma	26" Pine	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
39	3727 Latma	17" Magnolia	20%b dieback, Ordinance tree	12' checkerplate, Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
40	Not available	23" Magnolia	20% dieback, Private tree	Clearance prune, Root prune for waterline fittings and street, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
41	3726 Latma	18" Magnolia	20% dieback, Private tree	Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
42	3726 Latma	18" Pine	Ordinance tree	Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
43	3726 Latma	19" Live Oak	Ordinance tree	20' checkerplate, Zero curb cutback, Demo-Form-Pour sidewalk without damage to roots > 1", Fence, Clearance prune
44	3722 Latma	27" Live Oak	Ordinance tree	Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
45	3722 Latma	18" Sugarberry	Butt rot, Structurally not sound, Not ordinance tree	Remove tree, No replacement required
46	3727 Latma	8" Magnolia	Private tree	12' checkerplate, Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
47	3723 Latma	8" Live Oak	Private tree, will not be impacted	
48	3723 Latma	9" Live Oak	Private tree, will not be impacted	
49	3715 Latma	27" Willow Oak	40% dieback, Private tree	Fence, Root prune for waterline
50	3715 Latma	8" Crepe Myrtle	Private tree, will not be impacted	
51	3711 Latma	10" Magnolia	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
52	3711 Latma	19" Pine	Private tree	16' checkerplate, Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"

NOTE:
THIS TREE PROTECTION PLAN WAS DEVELOPED WITH INFORMATION PROVIDED BY DESIGN ENGINEER IN DRAWINGS DATED JULY 2011. THE PLAN CONSIDERS ALL FITTINGS, VERTICAL OFFSETS AND AREAS OF NECESSARY EXCAVATION. CHANGES MADE TO DESIGN MAY COMPROMISE THE TREE PROTECTION PLAN. REFER SPECIFICATIONS 01562 AND 02915. CONDITION OF EACH TREE IS BASED ON VISUAL EVALUATION AT TIME OF DESIGN. CONDITION AND STRUCTURAL INTEGRITY OF EACH TREE IS NOT GUARANTEED BY DESIGNER AT ANY POINT IN THE FUTURE, AS ENVIRONMENTAL AND MAINTENANCE INFLUENCES ON EACH TREE CAN NOT BE DETERMINED BY DESIGNER.

Tree No.	Location	Description	Comments	Treatment
Trees on Latma Drive				
53	3714 Latma	25" Southern Red Oak	20% dieback, Private tree	20' checkerplate, Root prune for wheel chair ramp, Root prune for waterline, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
54	3714 Latma	21" Southern Red Oak	30% dieback, Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
55	3714 Latma	19" Magnolia	Private tree	16' checkerplate, Root prune for street, Demo-Form-Pour sidewalk without damage to roots > 1", Fence, Clearance prune
56	3708 Latma	12" Live Oak	Private tree	Root prune for sidewalk, Fence, Clearance prune
57	3702 Latma	12" Water Oak	Private tree	Fence, Root prune for sidewalk
58	3702 Latma	2" Yaupon	Private tree, will not be impacted	
59	Not available	14" Magnolia	Private tree	Fence, Root prune for sidewalk
60	3703 Latma	2" Texas Red Oak	Ordinance tree	Fence, Bore waterline, Demo-Form-Pour sidewalk without damage to roots > 1"
61	3703 Latma	22" Pine	Ordinance tree	Root prune for street, Fence, Bore waterline, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
62	3635 Latma	8" Shumard Oak	Private tree, will not be impacted	
63	3631 Latma	25" Water Oak	Private tree	Pipe burst/auger sanitary, Fence, Root prune for sidewalk
64	3630 Latma	10" Crepe Myrtle	Topped to 5', Not ordinance tree	
65	3630 Latma	14" Pine	Private tree, will not be impacted	
66	3630 Latma	12" Crepe Myrtle	Private tree, will not be impacted	
67	3622 Latma	25" Live Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
68	3627 Latma	23" Pine	Ordinance tree	16' checkerplate, Pipe burst/auger sanitary, Root prune for street, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
69	Not available	9" Magnolia	15% dieback, Private tree	Pipe burst/auger sanitary, Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
70	Not available	13" Magnolia	Private tree	Pipe burst/auger sanitary, Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
71	3615 Latma	4" Vitex	Private tree, will not be impacted	
72	3615 Latma	22" Lacebark Elm	Private tree	Pipe burst/auger sanitary, Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
73	3611 Latma	9" Bradford Pear	Private tree	Fence, Pipe burst/auger sanitary
74	3611 Latma	10" Bradford Pear	Private tree	Fence, Pipe burst/auger sanitary
75	3610 Latma	18" Water Oak	Ordinance tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Hand dig for water line connection, Clearance prune
76	3610 Latma	14" Water Oak	Ordinance tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
77	3602 Latma	11" Crepe Myrtle	Topped to 7', Private tree, will not be impacted	
78	3602 Latma	23" Raintree	Multi trunk, Private tree	Root prune for waterline, Fence, Clearance prune
79	3607 Latma	27" Live Oak	Interior stripped out, Private tree	Pipe burst/auger sanitary, Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
80	3607 Latma	14" Pine	Private tree	Pipe burst/auger sanitary, Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
81	3603 Latma	19" Live Oak	Ordinance tree	16' checkerplate, Pipe burst/auger sanitary, Root prune for street, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
82	3603 Latma	13" Pine	Ordinance tree	16' checkerplate, Pipe burst/auger sanitary, Root prune for street, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
83	Not available	19" Water Oak	Private tree	Pipe burst/auger sanitary, Fence, Root prune for sidewalk
84	3531 Latma	25" Water Oak	Private tree	Root prune for sidewalk, Fence, Clearance prune
85	3531 Latma	23" Pecan	Private tree	Fence, Root prune for sidewalk
86	3527 Latma	14" Magnolia	30% dieback, Private tree	Fence, Root prune for sidewalk
87	3527 Latma	34" Live Oak	Private tree	Root prune for sidewalk, Fence, Clearance prune
88	3523 Latma	13" Sweetgum	20% dieback, Private tree	Root prune for sidewalk, Fence, Clearance prune
89	3519 Latma	27" Live Oak	30% dieback, Private tree	Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
90	Not available	3" Shumard Oak	Ordinance tree, Remove for water connection	Remove tree, Provide 3" in replacement planting to comply with oridnance
91	Not available	6" Shumard Oak	Ordinance tree, Remove for water connection	Remove tree, Provide 6" in replacement planting to comply with ordinance
92	Not available	3" Italian Cypress	Not ordinance tree	
93	Not available	12" Water Oak	40% dieback, Private tree	Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
94	Not available	3" Italian Cypress	Not ordinance tree	
95	3526 Latma	13" Magnolia	30% dieback, Private tree	Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
96	3526 Latma	47" Live Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune

TREE PRESERVATION PLAN LEGEND

- 1 — TREE NUMBER/LOCATION
- (1) — TREE TO BE REMOVED
- -X-X- — TREE PROTECTION FENCE
- ------ — ROOT PRUNING TRENCH
- ⊙ — REPLACEMENT PLANTING SPECIES AND SIZE/TYPE
- OCC — ZERO CUTBACK CURB
- ▬ — DEMO, FORM, POUR WALK WITHOUT DAMAGE TO ROOTS 1" OR LARGER
- ▩ — CHECKERPLATE SECTION

MK.	DESCRIPTION	DATE	DWN.	CHK.

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SURVEYED BY:
Landtech Consultants, Inc.
FB NO. 5543

Job No.: 09-051	Dwn By: NB
Date: April 2010	Chkd By: C.N.K.

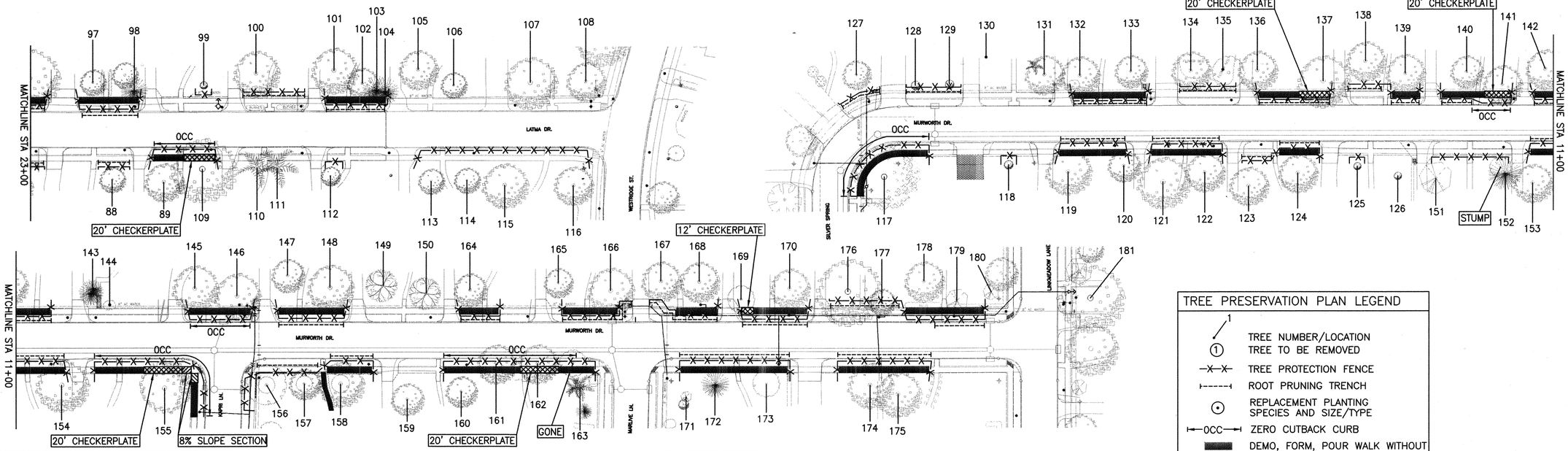
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

TREE PROTECTION PLAN
SHEET 1 OF 9

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	
DRAWING SCALE	
1"=40'	
CITY OF HOUSTON PM	
Mark Board, P.E.	
SHEET No: 98 OF 122	

PUBLIC WORKS AND ENGINEERING — ANTI FILED — 48978 — LICENSE NUMBER — STATE OF TEXAS



TREE PRESERVATION PLAN LEGEND

- TREE NUMBER/LOCATION
- (1) TREE TO BE REMOVED
- TREE PROTECTION FENCE
- ROOT PRUNING TRENCH
- REPLACEMENT PLANTING SPECIES AND SIZE/TYPE
- OCC ZERO CUTBACK CURB
- DEMO, FORM, POUR WALK WITHOUT DAMAGE TO ROOTS 1" OR LARGER
- CHECKERPLATE SECTION
- 8% SLOPE SECTION

NOTE:
THIS TREE PROTECTION PLAN WAS DEVELOPED WITH INFORMATION PROVIDED BY DESIGN ENGINEER IN DRAWINGS DATED JULY 2011. THE PLAN CONSIDERS ALL FITTINGS, VERTICAL OFFSETS AND AREAS OF NECESSARY EXCAVATION. CHANGES MADE TO DESIGN MAY COMPROMISE THE TREE PROTECTION PLAN. REFER SPECIFICATIONS 01562 AND 02915. CONDITION OF EACH TREE IS BASED ON VISUAL EVALUATION AT TIME OF DESIGN. CONDITION AND STRUCTURAL INTEGRITY OF EACH TREE IS NOT GUARANTEED BY DESIGNER AT ANY POINT IN THE FUTURE, AS ENVIRONMENTAL AND MAINTENANCE INFLUENCES ON EACH TREE CAN NOT BE DETERMINED BY DESIGNER.

Tree No.	Location	Description	Comments	Treatment
Trees on	Latma Drive			
97	3522 Latma	12" Lacebark Elm	Topped in past, Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
98	3522 Latma	17" Pine	Ordinance tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
99	3518 Latma	6" Live Oak	Private tree	Fence
100	3514 Latma	33" Arizona Ash	Private tree	Fence, Root prune for sidewalk
101	3510 Latma	34" Water Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
102	3510 Latma	26" Water Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
103	3510 Latma	19" Pine	Ordinance tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
104	3510 Latma	19" Pine	Ordinance tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
105	3506 Latma	33" Water Oak	Private tree, will not be impacted	
106	3506 Latma	12" Water Oak	Private tree, will not be impacted	
107	3502 Latma	45" Live Oak	Private tree, will not be impacted	
108	3502 Latma	16" Live Oak	Private tree, will not be impacted	
109	3519 Latma	54" Live Oak	40% dieback, Ordinance tree	8% slope section to drive, 20' checkerplate, Zero curb cutback, Demo-Form-Pour sidewalk without damage to roots > 1", Fence, Clearance prune
110	3515 Latma	8" Canary Island Palm	Not ordinance tree	
111	3515 Latma	8" Canary Island Palm	Not ordinance tree	
112	3511 Latma	14" Raintree	60% dieback, Private tree	Pipe burst/auger sanitary sewer, Fence
113	3507 Latma	16" Raintree	Private tree	Pipe burst/auger sanitary sewer, Fence
114	3507 Latma	15" Raintree	Private tree	Pipe burst/auger sanitary sewer, Fence
115	3501 Latma	43" Water Oak	Private tree	Pipe burst/auger sanitary sewer, Fence
116	3501 Latma	20" Live Oak	Private tree	Pipe burst/auger sanitary sewer, Fence
Trees on	Murworth Drive			
117	9001 Silver Springs	46" Water Oak	Private tree, will not be impacted	Bore waterline, Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
118	9001 Silver Springs	6" Live Oak	Ordinance tree	Fence
119	3827 Murworth	35" Live Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
120	3827 Murworth	23" Live Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
121	3823 Murworth	33" Water Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
122	3823 Murworth	27" Water Oak	Interior stripped out, Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
123	3819 Murworth	28" Water Oak	Private tree	Fence, Root prune for sidewalk
124	3819 Murworth	38" Water Oak	30% dieback, Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
125	3815 Murworth	5" Water Oak	Private tree	Fence
126	3815 Murworth	7" Bradford Pear	Private tree, will not be impacted	
127	3838 Murworth	14" Live Oak	Private tree	Root prune for sidewalk, Fence, Clearance prune
128	3834 Murworth	6" Water Oak	Ordinance tree	Fence, Root prune for sidewalk
129	3834 Murworth	6" Bur Oak	Ordinance tree	Fence, Root prune for sidewalk
130	3830 Murworth	22" Water Oak	70% dieback, Private tree, will not be impacted	
131	3830 Murworth	27" Water Oak	Topped, Poor, Private tree, will not be impacted	
132	Not available	29" Water Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
133	Not available	26" Water Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
134	3822 Murworth	24" Water Oak	60% dieback, Private tree	Fence, Root prune for sidewalk
135	3822 Murworth	21" Water Oak	50% dieback, Private tree	Fence, Root prune for sidewalk
136	3818 Murworth	37" Water Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
137	3818 Murworth	54" Water Oak	Private tree	20' checkerplate, Root prune for street, Demo-Form-Pour sidewalk without damage to roots > 1", Fence, Clearance prune
138	3814 Murworth	32" Water Oak	Private tree	Fence, Root prune for sidewalk
139	3814 Murworth	35" Water Oak	15% dieback, Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
140	Not available	25" Water Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
141	Not available	26" Water Oak	Ordinance tree	20' checkerplate, Zero curb cutback, Demo-Form-Pour sidewalk without damage to roots > 1", Fence, Clearance prune
142	3806 Murworth	34" Water Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
143	3802 Murworth	10" Pine	Private tree, will not be impacted	
144	3802 Murworth	5" Sago Palm	Not ordinance tree	
145	3734 Murworth	27" Live Oak	40% dieback, Private tree	Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
146	3734 Murworth	33" Live Oak	Private tree	Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
147	3730 Murworth	28" Live Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
148	3730 Murworth	34" Live Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
149	3726 Murworth	23" Tallow	Private tree, will not be impacted	
150	3726 Murworth	19" Tallow	Private tree, will not be impacted	

Tree No.	Location	Description	Comments	Treatment
Trees on	Murworth Drive			
151	3811 Murworth	21" Magnolia	Private tree	Fence, Root prune for sidewalk
152	3811 Murworth	19" Pine	Private tree	Fence, Root prune for sidewalk
153	3807 Murworth	33" Water Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
154	3807 Murworth	43" Water Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
155	3803 Murworth	43" Live Oak	Private tree	8% slope to WCR, 20' checkerplate, Zero curb cutback, Fence, Demo-Form-Pour sidewalk ithout damage to roots > 1", Clearance prune
156	3729 Murworth	27" Arizona Ash	Topped in past, Private tree	Fence, Root prune for sidewalk, Bore waterline
157	3729 Murworth	21" Arizona Ash	Dieback, Private tree	Fence, Root prune for sidewalk
158	3729 Murworth	35" Arizona Ash	40% dieback, Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
159	3725 Murworth	34" Water Oak	Private tree, will not be impacted	
160	3725 Murworth	21" Arizona Ash	30% dieback, Private tree	Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
161	3721 Murworth	21" Arizona Ash	Ordinance tree	Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
162	3721 Murworth	33" Arizona Ash	Ordinance tree	20' checkerplate, Zero curb cutback, Demo-Form-Pour sidewalk without damage to roots > 1", Fence, Clearance prune
163	3721 Murworth	14' Palm	Private tree, will not be impacted	
164	3722 Murworth	28" Live Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
165	3718 Murworth	19" Water Oak	Private tree, will not be impacted	
166	3718 Murworth	34" Live Oak	Private tree	Root prune for water tie-in, Root prune for street, Demo-Form-Pour sidewalk without damage to roots > 1", Fence, Clearance prune
167	Not available	26" Live Oak	Private tree	Root prune for water tie-in, Root prune for street, Demo-Form-Pour sidewalk without damage to roots > 1", Fence, Clearance prune
168	Not available	23" Live Oak	Private tree	Root prune for street, Fence, Bore waterline, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune, Handdig tap and lead
169	Not available	17" Sycamore	20% dieback, Ordinance tree	12' checkerplate, Root prune for street, Fence, Bore waterline, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
170	Not available	26" Live Oak	Private tree	Root prune for street, Fence, Bore waterline, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune, Handdig tap and lead
171	3711 Murworth	9" Magnolia	Private tree, will not be impacted	
172	3711 Murworth	13" Pine	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
173	3711 Murworth	14" Pecan	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
174	3707 Murworth	27" Water Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
175	3703 Murworth	25" Arizona Ash	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
176	3706 Murworth	43" Water Oak	Private tree	Fence, Root prune for sidewalk
177	3706 Murworth	13" Water Oak	Ordinance tree	Root prune for sidewalk, Fence, Clearance prune
178	3702 Murworth	27" Water Oak	Interior stripped out, Private tree	Fence, Bore waterline, Demo-Form-Pour sidewalk without damage to roots > 1"
179	3702 Murworth	14" Magnolia	Ordinance tree	Root prune for street, Fence, Bore waterline, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune, handdig tap and lead
180	3702 Murworth	9" Magnolia	Private tree, will not be impacted	
181	Not available	24" Live Oak	Private tree	Hand dig for fire hydrant and tee

MK.	DESCRIPTION	DATE	DWN.	CHK.

REVISIONS

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Job No.: 09-051	Dwn By: NB
Date: April 2010	Chkd By: C.N.K.

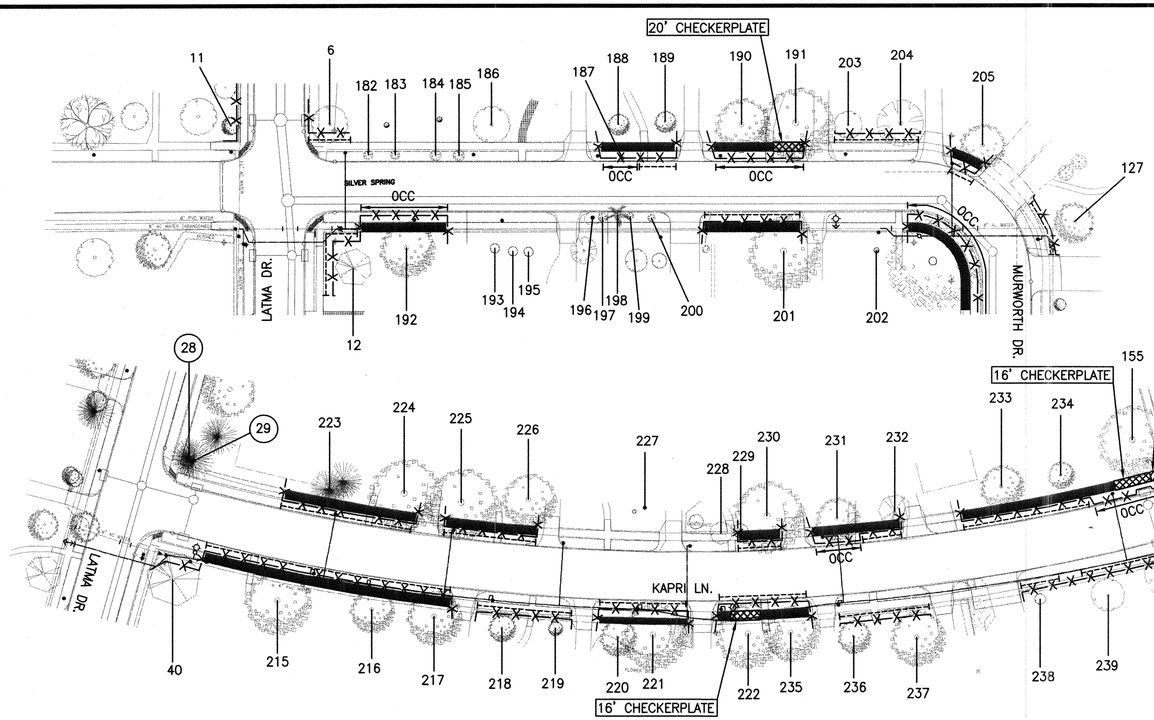
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

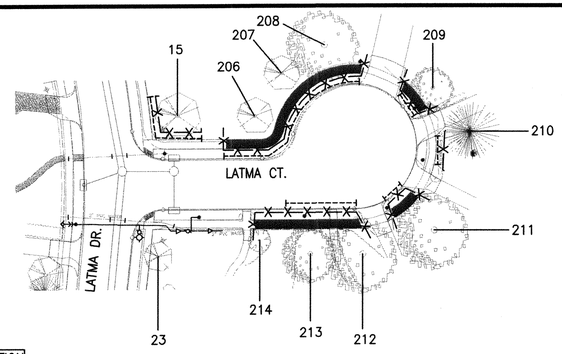
City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

TREE PROTECTION PLAN
SHEET 2 OF 9

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	
DRAWING SCALE	
1"=40'	
CITY OF HOUSTON PM	
Mark Board, P.E.	
SHEET No: 99 OF 122	

PUBLIC WORKS AND ENGINEERING — REVIEWED AND FILED — 48978 — NUMBER — TEXAS





TREE PRESERVATION PLAN LEGEND

- 1 — TREE NUMBER/LOCATION
- (1) — TREE TO BE REMOVED
- —X—X— TREE PROTECTION FENCE
- ------ ROOT PRUNING TRENCH
- ⊙ REPLACEMENT PLANTING SPECIES AND SIZE/TYPE
- —OCC— ZERO CUTBACK CURB
- DEMO, FORM, POUR WALK WITHOUT DAMAGE TO ROOTS 1" OR LARGER
- CHECKERPLATE SECTION
- 8% SLOPE SECTION

NOTE:
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Tree No.	Location	Description	Comments	Treatment
Trees on	Silver Springs Drive			
182	9018 Silver Springs	6" Crepe Myrtle	Not ordinance tree	
183	9018 Silver Springs	6" Crepe Myrtle	Not ordinance tree	
184	9018 Silver Springs	6" Crepe Myrtle	Not ordinance tree	
185	9018 Silver Springs	6" Crepe Myrtle	Not ordinance tree	
186	Not available	15" Juniper	Private tree, will not be impacted	
187	9010 Silver Springs	2" Magnolia	Ordinance tree	Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
188	9010 Silver Springs	10" Live Oak	Private tree	Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
189	9010 Silver Springs	10" Live Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
190	9006 Silver Springs	23" Arizona Ash	Private tree	Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
191	9006 Silver Springs	45" Arizona Ash	Private tree	20' checkerplate, Zero curb cutback, Demo-Form-Pour sidewalk without damage to roots > 1", Fence, Clearance prune
192	3824 Latma	28" Live Oak	Private tree	Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
193	Not available	3" Peach	Private tree, will not be impacted	
194	Not available	3" Peach	Private tree, will not be impacted	
195	Not available	3" Peach	Private tree, will not be impacted	
196	9015 Silver Springs	4" Crepe Myrtle	Not ordinance tree	
197	9015 Silver Springs	4" Crepe Myrtle	Not ordinance tree	
198	9015 Silver Springs	3" Palm	Not ordinance tree	
199	9015 Silver Springs	4" Crepe Myrtle	Not ordinance tree	
200	9015 Silver Springs	4" Crepe Myrtle	Not ordinance tree	
201	9001 Silver Springs	45" Live Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
202	9001 Silver Springs	3" Live Oak	Private tree, will not be impacted	
203	9002 Silver Springs	7" Photinia	Private tree	Root prune for sidewalk, Fence, Clearance prune
204	9002 Silver Springs	22" Crepe Myrtle	Private tree	Fence, Root prune for sidewalk
205	3824 Silver Springs	26" Water Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
Trees on	Latma Court			
206	9008 Latma Ct	14" Magnolia	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
207	9008 Latma Ct	15" Magnolia	30% dieback, Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
208	9008 Latma Ct	36" Shumard Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
209	9002 Latma Ct	21" Live Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
210	9003 Latma Ct	26" Pine	Private tree	Fence, Root prune for sidewalk
211	Not available	34" Live Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
212	9011 Latma Ct	35" Live Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
213	9011 Latma Ct	25" Live Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
214	9005 Latma Ct	11" Crepe Myrtle	Not ordinance tree	Clearance prune

Tree No.	Location	Description	Comments	Treatment
Trees on	Kapri Lane			
215	9031 Kapri	35" Live Oak	Private tree	Root prune for street, Fence, Bore waterline, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune, Handdig tap and lead
216	9027 Kapri	18" Live Oak	Ordinance tree	Root prune for street, Fence, Bore waterline, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune, Handdig tap and lead
217	9027 Kapri	26" Live Oak	Ordinance tree	Root prune for street, Fence, Bore waterline, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune, Handdig tap and lead
218	9023 Kapri	11" Live Oak	Private tree	Fence, Root prune for waterline
219	9023 Kapri	8" Live Oak	Ordinance tree	Fence, Root prune for waterline
220	Not available	17" Water Oak	40% dieback, Private tree	Root prune for street, Fence, Bore waterline, Demo-Form-Pour sidewalk without damage to roots > 1"
221	Not available	32" Water Oak	30% dieback, Ordinance tree	Root prune for street, Fence, Bore waterline, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune, Handdig tap and lead
222	9015 Kapri	25" Water Oak	Ordinance tree	16' checkerplate, Root prune for street, Demo-Form-Pour sidewalk without damage to roots > 1", Fence, Bore waterline, Hand dig for fire hydrant and tap & lead, Clearance prune
223	9026 Kapri	19" Pine	Ordinance tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Hand dig lead
224	9026 Kapri	36" Arizona Ash	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
225	Not available	37" Live Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
226	Not available	25" Live Oak	50% dieback, Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
227	9018 Kapri	2" Leyland Cypress	Private tree, will not be impacted	
228	9014 Kapri	5" Juniper	Not ordinance tree	
229	9014 Kapri	5" Juniper	Not ordinance tree	
230	9014 Kapri	27" Shumard Oak	Topped in past, Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
231	9010 Kapri	21" Water Oak	Ordinance tree	Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune, Hand dig lead
232	9010 Kapri	14" Magnolia	30% dieback, Ordinance tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
233	3803 Murworth	18" Live Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
234	3803 Murworth	11" Live Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
235	9015 Kapri	23" Water Oak	Ordinance tree	Root prune for street, Fence, Bore waterline, Demo-Form-Pour sidewalk without damage to roots > 1"
236	9011 Kapri	14" Live Oak	Private tree	Root prune for waterline, Fence, Clearance prune
237	9011 Kapri	27" Live Oak	Private tree	Root prune for waterline, Fence, Clearance prune
238	3729 Murworth	5" Pecan	Ordinance tree	Fence, Root prune for waterline
239	3729 Murworth	14" Pecan	Private tree	Fence, Root prune for waterline

MB

MK.	DESCRIPTION	DATE	DWN.	CHK.

REVISIONS

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APPROVED: Craig N. Koehl 10/13/11

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Date: April 2010 | Chkd By: C.N.K.

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
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TREE PROTECTION PLAN
SHEET 3 OF 9

WBS NO.
N-000378-0002-4

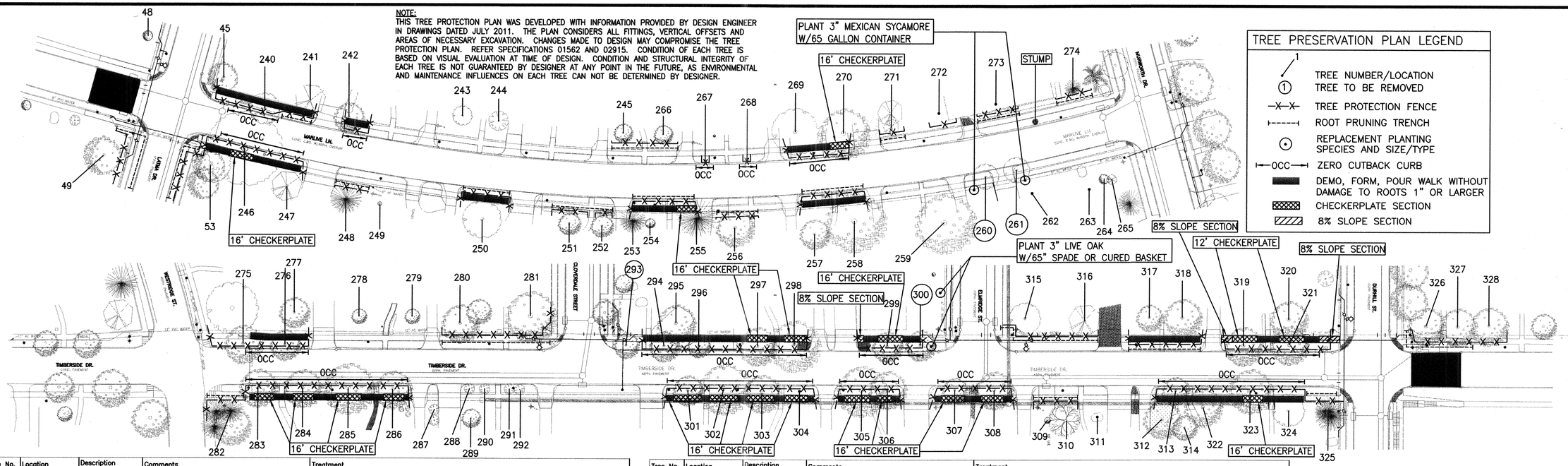
DRAWING SCALE
1"=40'

CITY OF HOUSTON PM
Mark Board, P.E.

SHEET No: 100 OF 122

FOR CITY OF HOUSTON USE ONLY

PUBLIC WORKS AND ENGINEERING — PLANS FILED — 48978 — LICENSE NUMBER — STATE OF TEXAS



Tree No.	Location	Description	Comments	Treatment
Trees on	Marlive Lane			
240	Not available	18" Live Oak	30% dieback, Ordinance tree	Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
241	Not available	22" Pecan	Topped in past, Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
242	Not available	16" Live Oak	Topped in past, Ordinance tree	Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
243	9030 Marlive	13" Pecan	Topped to 7', Private tree, will not be impacted	
244	9030 Marlive	5" Crepe Myrtle	Topped to 7', Private tree, will not be impacted	
245	9022 Marlive	12" Live Oak	Private tree	Root prune for sidewalk, Fence, Clearance prune
246	3714 Latma	45" Arizona Ash	Ordinance tree	16' checkerplate, Zero curb cutback, Fence, Demo-form-pour sidewalk without damage to roots > 1", Fence, Clearance prune
247	3714 Latma	9" Holly	Private tree, will not be impacted	
248	3714 Latma	22" Pine	Private tree	Fence, Root prune for sidewalk
249	9035 Marlive	3" Water Oak	Private tree, will not be impacted	
250	9031 Marlive	27" Pecan	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
251	9027 Marlive	13" Live Oak	Private tree	Root prune for sidewalk, Fence, Clearance prune
252	9027 Marlive	15" Live Oak	Private tree	Root prune for sidewalk, Fence, Clearance prune
253	9023 Marlive	18" Pine	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
254	9023 Marlive	8" Live Oak	Will be protected with Tree # 253	
255	9023 Marlive	21" Pine	Ordinance tree	16' checkerplate, Root prune for street, Demo-Form-Pour sidewalk without damage to roots > 1", Fence, Clearance prune
256	9019 Marlive	23" Live Oak	40% dieback, Private tree	Root prune for sidewalk, Fence, Clearance prune
257	9015 Marlive	22" Live Oak	20% dieback, Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
258	9015 Marlive	45" Live Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
259	9011 Marlive	43" Arizona Ash	30% dieback, Private tree, will not be impacted	
260	3711 Murworth	13" Sycamore	50% dead, Not ordinance tree	Remove tree, No replacement required
261	3711 Murworth	15" Sycamore	Lightening strike, Hypoxylon, Not ordinance tree	Remove tree, No replacement required
262	3711 Murworth	16" Pecan	Private tree, will not be impacted	
263	3711 Murworth	16" Pecan	Private tree, will not be impacted	
264	3711 Murworth	8" Black Walnut	Private tree, will not be impacted	
265	3711 Murworth	8" Magnolia	Private tree	Clearance prune
266	9022 Marlive	9" Live Oak	Private tree	Fence, Root prune for sidewalk
267	9018 Marlive	2" Baldcypress	Ordinance tree	Zero curb cutback, Fence, Clearance prune
268	9018 Marlive	2" Red Maple	Ordinance tree	Zero curb cutback, Fence, Clearance prune
269	9014 Marlive	29" Arizona Ash	40% dieback, Private tree	Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
270	9014 Marlive	38" Live Oak	30% dieback, Ordinance tree	16' checkerplate, Zero curb cutback, Fence, Demo-form-pour sidewalk without damage to roots > 1", Fence, Clearance prune
271	9010 Marlive	9" Magnolia	Ordinance tree	Root prune for sidewalk, Fence, Clearance prune
272	9010 Marlive	10" Lacebark Elm	Private tree	Fence, Clearance prune
273	3721 Murworth	11" pine	Private tree	Fence, Root prune for sidewalk
274	3721 Murworth	10" Pine	Private tree	Fence, Root prune for sidewalk
Trees on	Timberside Drive			
275	3500 Westridge	25" Live Oak	Ordinance tree	Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
276	3500 Westridge	16" Live Oak	Ordinance tree	Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
277	3500 Westridge	23" Arizona Ash	60% dieback, Private tree	
278	9138 Timberside	9" Red Maple	40% dieback, Private tree	
279	9138 Timberside	10" Red Maple	Private tree, will not be impacted	
280	Not available	25" Live Oak	Private tree	Root prune for sidewalk, Fence, Clearance prune
281	Not available	44" Live Oak	Private tree	Root prune for sidewalk, Fence, Clearance prune
282	9143 Timberside	13" Pine	Private tree	Fence, Root prune for waterline
283	9143 Timberside	26" Live Oak	Ordinance tree	16' checkerplate, Zero curb cutback, Fence, Demo-form-pour sidewalk without damage to roots > 1", Fence, Clearance prune
284	9143 Timberside	27" Live Oak	Ordinance tree	16' checkerplate, Zero curb cutback, Fence, Demo-form-pour sidewalk without damage to roots > 1", Fence, Clearance prune
285	9139 Timberside	29" Live Oak	Ordinance tree	16' checkerplate, Zero curb cutback, Fence, Demo-form-pour sidewalk without damage to roots > 1", Fence, Clearance prune
286	9139 Timberside	25" Live Oak	Ordinance tree	16' checkerplate, Zero curb cutback, Fence, Demo-form-pour sidewalk without damage to roots > 1", Fence, Clearance prune
287	9135 Timberside	7" Crepe Myrtle	Private tree, will not be impacted	
288	9135 Timberside	7" Crepe Myrtle	Not ordinance tree	Clearance prune

Tree No.	Location	Description	Comments	Treatment
Trees on	Timberside Drive			
289	9135 Timberside	13" Mulberry	Private tree, will not be impacted	
290	9135 Timberside	7" Crepe Myrtle	Not ordinance tree	Clearance prune
291	9135 Timberside	7" Crepe Myrtle	Not ordinance tree	Clearance prune
292	9135 Timberside	7" Crepe Myrtle	Not ordinance tree	Clearance prune
293	9126 Timberside	13" Live Oak	Ordinance tree, Remove for wheel chair ramp	Remove tree, Provide 13" replacement to comply with ordinance
294	9126 Timberside	15" Live Oak	Ordinance tree	Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
295	9126 Timberside	25" Water Oak	Interior stripped out, Private tree	Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
296	9126 Timberside	13" Live Oak	Ordinance tree	Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
297	9122 Timberside	25" Live Oak	Ordinance tree	16' checkerplate, Zero curb cutback, Fence, Demo-form-pour sidewalk without damage to roots > 1", Fence, Clearance prune
298	9122 Timberside	27" Live Oak	Ordinance tree	8% slope to drive, 16' checkerplate, Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
299	3502 Elmridge	25" Live Oak	Ordinance tree	8% slope to drive, 16' checkerplate, Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
300	3502 Elmridge	17" Live Oak	Ordinance tree, Remove for wheel chair ramp	Remove tree, provide 17" in replacement planting
301	9127 Timberside	15" Live Oak	Ordinance tree	16' checkerplate, Zero curb cutback, Fence, Demo-form-pour sidewalk without damage to roots > 1", Fence, Clearance prune
302	9127 Timberside	26" Live Oak	Ordinance tree	16' checkerplate, Zero curb cutback, Fence, Demo-form-pour sidewalk without damage to roots > 1", Fence, Clearance prune
303	9123 Timberside	25" Live Oak	Ordinance tree	Pipe burst/auger sanitary, 16' checkerplate, Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
304	9123 Timberside	14" Live Oak	Ordinance tree	Pipe burst/auger sanitary, 16' checkerplate, Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
305	9119 Timberside	28" Live Oak	Ordinance tree	Pipe burst/auger sanitary, 12' checkerplate, Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
306	9119 Timberside	21" Live Oak	Ordinance tree	Pipe burst/auger sanitary, 12' checkerplate, Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
307	9115 Timberside	15" Live Oak	Ordinance tree	Pipe burst/auger sanitary, 12' checkerplate, Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
308	9115 Timberside	25" Live Oak	Ordinance tree	Pipe burst/auger sanitary, 12' checkerplate, Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
309	9111 Timberside	6" White Ash	Private tree, will not be impacted	
310	9111 Timberside	27" Tallow	Private tree	Fence, Pipe burst/auger sanitary, Root prune for sidewalk
311	9111 Timberside	5" Mountain Laure	Private tree, will not be impacted	
312	9107 Timberside	33" Live Oak	30% dieback, Private tree	Fence, Pipe burst/auger sanitary, Root prune for sidewalk
313	9107 Timberside	14" Live Oak	Ordinance tree	Pipe burst/auger sanitary, Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
314	9107 Timberside	14" Sweetgum	50% dieback, Private tree	Fence, Pipe burst/auger sanitary, Root prune for sidewalk
315	3502 Elmridge	15" Sycamore	Private tree	Root prune for waterline on Timberside and sanitary on Elmridge, Fence, Clearance prune
316	3502 Elmridge	28" Magnolia	Private tree	Root prune for waterline, Fence, Clearance prune
317	9106 Elmridge	14" Sweetgum	20% dieback, Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
318	9106 Elmridge	46" Live Oak	30% dieback, Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
319	9102 Elmridge	20" Live Oak	Ordinance tree	8% slope to drive, 12' checkerplate, Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
320	9102 Elmridge	22" Water Oak	30% dieback, Private tree	Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
321	9102 Elmridge	21" Live Oak	20% dieback, Ordinance tree	8% slope to WCR, 12' checkerplate, Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune, Hand dig for water connection
322	9107 Elmridge	24" Live Oak	Ordinance tree	Pipe burst/auger sanitary, Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
323	9103 Elmridge	35" Live Oak	Ordinance tree	Pipe burst/auger sanitary, 16' checkerplate, Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune, Root stimulate
324	9103 Elmridge	23" Pecan	30% dieback, Ordinance tree	Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
325	9103 Elmridge	17" Pine	Ordinance tree	Fence, Bore waterline on Durhill, Root prune for sidewalk
326	9022 Elmridge	25" Live Oak	Private tree	Root prune for sidewalk, Fence, Clearance prune
327	9022 Elmridge	27" Live Oak	Private tree	Root prune for sidewalk, Fence, Clearance prune
328	9022 Elmridge	26" Live Oak	Private tree	Root prune for sidewalk, Fence, Clearance prune

MK.	DESCRIPTION	DATE	DWN.	CHK.

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HDR Engineering Inc. Texas Reg. No. F-754

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APPROVED: Craig N Koehl 12/6/11

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SURVEYED BY:
Landtech Consultants, Inc.
FB NO. 5543

Job No.: 09-051 | Dwn By: NB

Date: April 2010 | Chkd By: C.N.K.

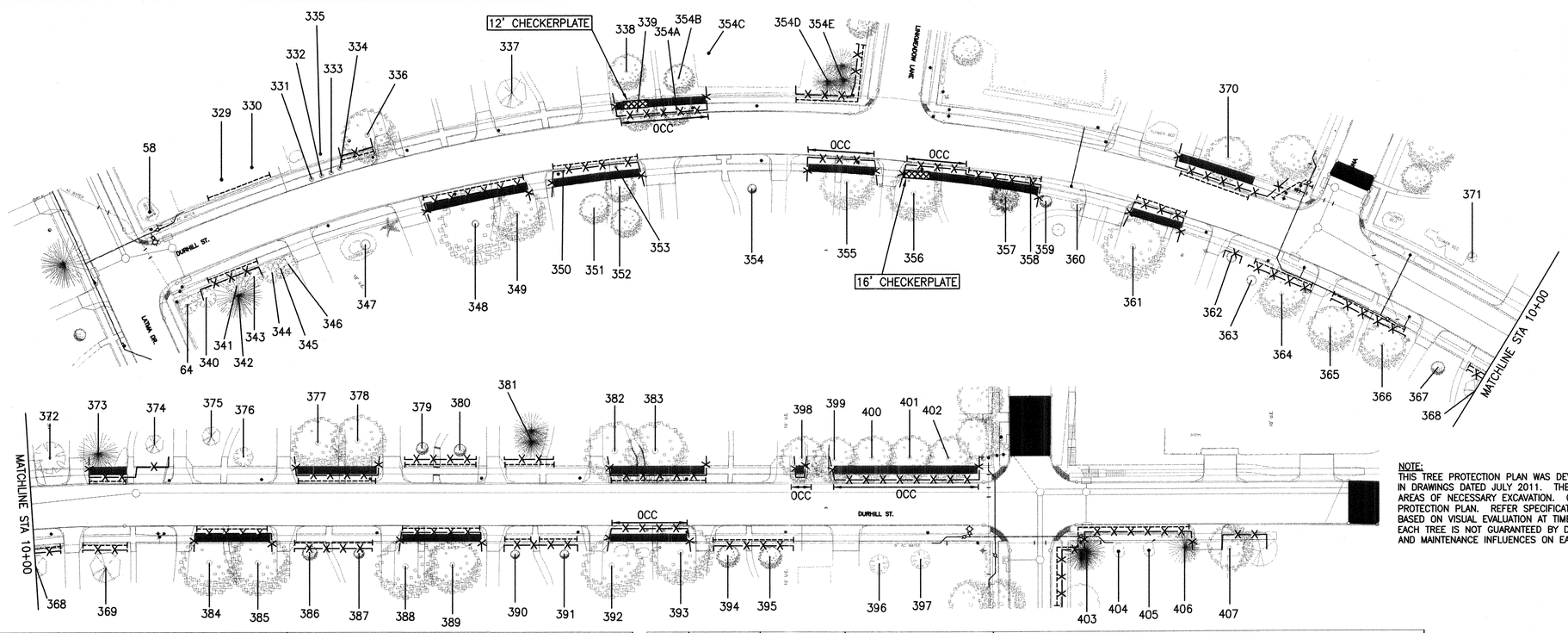
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

TREE PROTECTION PLAN
SHEET 4 OF 9

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	PUBLIC WORKS AND ENGINEERING REVIEWED AND FILED 48978 LICENSED
DRAWING SCALE	
1"=40'	
CITY OF HOUSTON PM	
Mark Board, P.E.	
SHEET No: 101 OF 122	

AB



TREE PRESERVATION PLAN LEGEND

- TREE NUMBER/LOCATION
- TREE TO BE REMOVED
- TREE PROTECTION FENCE
- ROOT PRUNING TRENCH
- REPLACEMENT PLANTING SPECIES AND SIZE/TYPE
- 0CC ZERO CUTBACK CURB
- DEMO, FORM, POUR WALK WITHOUT DAMAGE TO ROOTS 1" OR LARGER
- CHECKERPLATE SECTION
- 8% SLOPE SECTION

NOTE:
THIS TREE PROTECTION PLAN WAS DEVELOPED WITH INFORMATION PROVIDED BY DESIGN ENGINEER IN DRAWINGS DATED JULY 2011. THE PLAN CONSIDERS ALL FITTINGS, VERTICAL OFFSETS AND AREAS OF NECESSARY EXCAVATION. CHANGES MADE TO DESIGN MAY COMPROMISE THE TREE PROTECTION PLAN. REFER SPECIFICATIONS 01562 AND 02915. CONDITION OF EACH TREE IS BASED ON VISUAL EVALUATION AT TIME OF DESIGN. CONDITION AND STRUCTURAL INTEGRITY OF EACH TREE IS NOT GUARANTEED BY DESIGNER AT ANY POINT IN THE FUTURE, AS ENVIRONMENTAL AND MAINTENANCE INFLUENCES ON EACH TREE CAN NOT BE DETERMINED BY DESIGNER.

Tree No.	Location	Description	Comments	Treatment
Trees on	Durhill Street			
329	3702 Durhill	10" Water Oak	Private tree	Root prune for sidewalk
330	3702 Durhill	10" Water Oak	Private tree	Root prune for sidewalk
331	3718 Durhill	3" Crepe Myrtle	Not ordinance tree	
332	3718 Durhill	3" Crepe Myrtle	Not ordinance tree	
333	3718 Durhill	3" Crepe Myrtle	Not ordinance tree	
334	3718 Durhill	3" Crepe Myrtle	Not ordinance tree	
335	3718 Durhill	2" Saucer Magnolia	Private tree, will not be impacted	
336	3718 Durhill	31" Arizona Ash	Topped in past, Private tree	Fence, Root prune for sidewalk
337	3710 Durhill	15" Magnolia	30% dieback, Private tree, will not be impacted	
338	3706 Durhill	18" Lacebark Elm	40% dieback, Private tree, will not be impacted	
339	3706 Durhill	17" Water Oak	Ordinance tree	12' checkerplate, Zero curb cutback, Fence, Bore waterline, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
340	3630 Durhill	10" Crepe Myrtle	Topped, Not ordinance tree	
341	3630 Durhill	10" Crepe Myrtle	Topped, Not ordinance tree	
342	3630 Durhill	18" Pine	Private tree	Fence, Root prune for sidewalk
343	3630 Durhill	10" Crepe Myrtle	Topped, Not ordinance tree	
344	3630 Durhill	10" Crepe Myrtle	Topped, Not ordinance tree	
345	3630 Durhill	10" Crepe Myrtle	Topped, Not ordinance tree	
346	3630 Durhill	10" Crepe Myrtle	Topped, Not ordinance tree	
347	3719 Durhill	5" Bradford Pear	Private tree, will not be impacted	
348	3715 Durhill	29" Live Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
349	3715 Durhill	25" Live Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
350	3711 Durhill	2" Crepe Myrtle	Not ordinance tree	
351	3711 Durhill	17" Water Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
352	3711 Durhill	15" Water Oak	Ordinance tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
353	3711 Durhill	2" Crepe Myrtle	Not ordinance tree	
354	3707 Durhill	8" Nuttal Oak	Private tree, will not be impacted	
354A	3706 Durhill	14" Water Oak	Ordinance tree	Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
354B	3706 Durhill	14" Lacebark Elm	Private tree	Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
354C	Not available	27" Willow Oak	40% dieback, Private tree, will not be impacted	
354D	Not available	14" Pine	Private tree	Fence, Root prune for sidewalk
354E	Not available	10" Pine	Private tree	Fence, Root prune for sidewalk
355	3703 Durhill	28" Live Oak	Ordinance tree	Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
356	3619 Durhill	35" Live Oak	Private tree	16' checkerplate, Zero curb cutback, Fence, Demo-form-pour sidewalk without damage to roots > 1", Fence, Clearance prune
357	3611 Durhill	13" Lacebark Elm	40% dieback, Ordinance tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
358	3611 Durhill	9" Crepe Myrtle	Not ordinance tree, Remove for wider street	Remove tree, No replacement required
359	3611 Durhill	6" Callery Pear	Not ordinance tree	
360	3611 Durhill	9" Crepe Myrtle	Not ordinance tree	
361	3607 Durhill	29" Water Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
362	3603 Durhill	7" Savannah Holly	Ordinance tree	Fence
363	3603 Durhill	7" Savannah Holly	Private tree	Fence
364	3603 Durhill	25" Live Oak	Private tree	Root prune for water line, Fence, Clearance prune
365	3543 Durhill	24" Water Oak	Private tree	Root prune for water line, Fence, Clearance prune
366	3543 Durhill	17" Live Oak	Private tree	Root prune for water line, Fence, Clearance prune
367	Not available	9" Bur Oak	Private tree, will not be impacted	
368	Not available	15" Magnolia	Private tree	Root prune for sidewalk, Fence, Clearance prune

Tree No.	Location	Description	Comments	Treatment
Trees on	Durhill Street			
369	3535 Durhill	16" Magnolia	Private tree	Root prune for sidewalk, Fence, Clearance prune
370	3606 Durhill	24" Live Oak	Ordinance tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
371	Not available	5" Loquat	Private tree, will not be impacted	
372	Not available	15" Crepe Myrtle	Not ordinance tree	
373	3534 Durhill	22" Pine	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
374	3534 Durhill	15" Magnolia	Private tree	Fence, Clearance prune
375	3530 Durhill	12" Magnolia	Private tree, will not be impacted	
376	3530 Durhill	10" Crepe Myrtle	Not ordinance tree	
377	3526 Durhill	26" Willow Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
378	3526 Durhill	24" Willow Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
379	3522 Durhill	8" Nuttal Oak	Private tree	Fence, Root prune for sidewalk
380	3522 Durhill	10" Lacebark Elm	Private tree	Fence, Root prune for sidewalk
381	3518 Durhill	15" Pine	Private tree	Fence, Root prune for sidewalk
382	3514 Durhill	28" Live Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
383	3514 Durhill	35" Live Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
384	3531 Durhill	28" Water Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
385	3531 Durhill	37" Water Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
386	3527 Durhill	9" Live Oak	Ordinance tree	Root prune for sidewalk, Fence, Clearance prune
387	3527 Durhill	8" Live Oak	Private tree	Fence, Root prune for sidewalk
388	3523 Durhill	28" Water Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
389	3523 Durhill	25" Live Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
390	3519 Durhill	8" Live Oak	Private tree	Fence, Root prune for sidewalk
391	3519 Durhill	8" Live Oak	Private tree	Fence, Root prune for sidewalk
392	3514 Durhill	34" Live Oak	Private tree	Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
393	3514 Durhill	33" Live Oak	Private tree	Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
394	3511 Durhill	11" Shumard Oak	Private tree	Root prune for sidewalk, Fence, Clearance prune
395	3511 Durhill	11" Shumard Oak	Private tree	Root prune for sidewalk, Fence, Clearance prune
396	Not available	10" Crepe Myrtle	Private tree, will not be impacted	
397	Not available	10" Crepe Myrtle	Private tree, will not be impacted	
398	9022 Timberside	22" Live Oak	Ordinance tree	Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
399	9022 Timberside	26" Live Oak	Ordinance tree	Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
400	9022 Timberside	17" Live Oak	Ordinance tree	Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
401	9022 Timberside	23" Live Oak	Ordinance tree	Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
402	9022 Timberside	19" Live Oak	Ordinance tree	Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
403	Not available	22" Pine	Ordinance tree	Fence, Root prune for sidewalk, Hand dig for water connection
404	Not available	4" Crepe Myrtle	Not ordinance tree	
405	Not available	4" Crepe Myrtle	Not ordinance tree	
406	Not available	17" Pecan	Ordinance tree	Fence, Root prune for sidewalk
407	Not available	19" Live Oak	Ordinance tree	Root prune for sidewalk, Fence, Clearance prune

MK.	DESCRIPTION	DATE	DWN.	CHK.

REVISIONS

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SURVEYED BY:
Landtech Consultants, Inc.
FB NO. 5543

Job No.: 09-051 | Dwn By: NB
Date: April 2010 | Chkd By: C.N.K.

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

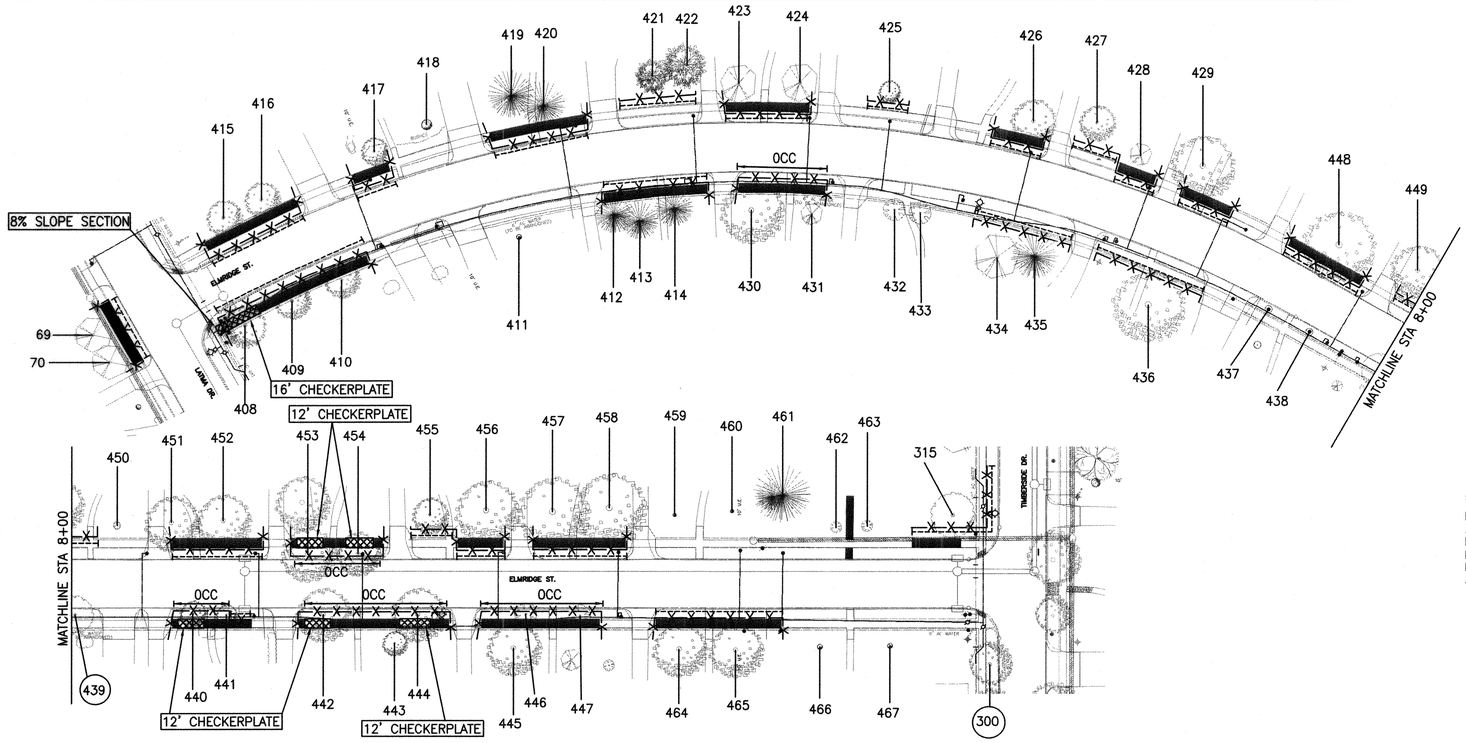
City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

TREE PROTECTION PLAN
SHEET 5 OF 9

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	
DRAWING SCALE	
1"=40'	
CITY OF HOUSTON PM	
Mark Board, P.E.	

PUBLIC WORKS AND ENGINEERING — ACCEPTED AND FILED — 48978 — JUMBER

SHEET No: 102 OF 122



TREE PRESERVATION PLAN LEGEND

- 1 — TREE NUMBER/LOCATION
- TREE PROTECTION FENCE
- ROOT PRUNING TRENCH
- REPLACEMENT PLANTING SPECIES AND SIZE/TYPE
- 0CC — ZERO CUTBACK CURB
- SIDEWALK ON GRADE
- 8% SLOPE SECTION
- CHECKERPLATE SECTION

NOTE:
THIS TREE PROTECTION PLAN WAS DEVELOPED WITH INFORMATION PROVIDED BY DESIGN ENGINEER IN DRAWINGS DATED JULY 2011. THE PLAN CONSIDERS ALL FITTINGS, VERTICAL OFFSETS AND AREAS OF NECESSARY EXCAVATION. CHANGES MADE TO DESIGN MAY COMPROMISE THE TREE PROTECTION PLAN. REFER SPECIFICATIONS 01562 AND 02915. CONDITION OF EACH TREE IS BASED ON VISUAL EVALUATION AT TIME OF DESIGN. CONDITION AND STRUCTURAL INTEGRITY OF EACH TREE IS NOT GUARANTEED BY DESIGNER AT ANY POINT IN THE FUTURE, AS ENVIRONMENTAL AND MAINTENANCE INFLUENCES ON EACH TREE CAN NOT BE DETERMINED BY DESIGNER.

Tree No.	Location	Description	Comments	Treatment	
Trees on	Elmridge Street				
408	3610 Elmridge	15" Water Oak	Ordinance tree	8% slope to WCR, 16' checkerplate, Root prune for street, Fence, Bore waterline, Demo-form-pour sidewalk without damage to roots . 1", Clearance prune	
409	3610 Elmridge	15" Water Oak	Ordinance tree	Root prune for street, Fence, Bore waterline, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune	
410	3610 Elmridge	17" Water Oak	Ordinance tree	Root prune for street, Fence, Bore waterline, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune	
411	3623 Elmridge	3" Live Oak	Private tree, will not be impacted		
412	3619 Elmridge	15" Pine	Private tree	Root prune for street, Fence, Bore waterline, Demo-Form-Pour sidewalk without damage to roots > 1"	
413	3619 Elmridge	18" Pine	Private tree	Root prune for street, Fence, Bore waterline, Demo-Form-Pour sidewalk without damage to roots > 1"	
414	3619 Elmridge	18" Pine	Private tree	Root prune for street, Fence, Bore waterline, Demo-Form-Pour sidewalk without damage to roots > 1"	
415	3622 Latrna	14" Shumard Oak	Ordinance tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune	
416	3622 Latrna	15" Nuttal Oak	Ordinance tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune	
417	3622 Latrna	16" Live Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune	
418	3622 Latrna	7" Texas Red Oak	Private tree, will not be impacted		
419	3622 Latrna	18" Pine	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"	
420	3622 Latrna	21" Pine	30% Ike damage, Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune	
421	3618 Elmridge	14" Lacebark Elm	Private tree	Fence, Root prune for sidewalk	
422	3618 Elmridge	18" Lacebark Elm	30% dieback, Private tree	Fence, Root prune for sidewalk	
423	3614 Elmridge	13" Magnolia	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune	
424	3614 Elmridge	13" Magnolia	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune	
425	3610 Elmridge	9" Water Oak	Private tree	Root prune for sidewalk, Fence, Clearance prune	
426	3606 Elmridge	22" Live Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune	
427	3602 Elmridge	18" Live Oak	Private tree	Root prune for sidewalk, Fence, Clearance prune	
428	3602 Elmridge	11" Magnolia	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune	
429	3538 Elmridge	26" Water Oak	20% dieback, Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune	
430	3615 Elmridge	35" Live Oak	Private tree	Zero curb cutback, Fence, Bore waterline, Demo-Form-Pour sidewalk without damage to roots > 1"	
431	3615 Elmridge	10" Magnolia	Private tree	Zero curb cutback, Fence, Bore waterline, Demo-Form-Pour sidewalk without damage to roots > 1"	
432	3609 Elmridge	7" Crepe Myrtle	Not ordinance tree		
433	3609 Elmridge	7" Crepe Myrtle	Not ordinance tree		
434	3603 Elmridge	13" Magnolia	Private tree	Fence, Root prune for waterline	
435	3603 Elmridge	18" Pine	Private tree	Fence, Root prune for waterline	
436	3535 Elmridge	37" Water Oak	Private tree	Root prune for waterline, Fence, Clearance prune	
437	Not available	3" Crepe Myrtle	Not ordinance tree	Clearance prune	
438	Not available	5" Crepe Myrtle	Not ordinance tree	Clearance prune	
439	3527 Elmridge	(6)5" Raintree	Not ordinance tree, Remove for street stabilization	Remove tree, No replacement required	0
440	3523 Elmridge	14" Live Oak	Ordinance tree	12' checkerplate, Zero curb cutback, Fence, Bore waterline, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune	
441	3523 Elmridge	10" Live Oak	Ordinance tree	Root prune for inlet, Zero curb cutback, Fence, Bore waterline, Demo-form-pour sidewalk without damage to roots >1", Clearance prune, Root stimulate	

Tree No.	Location	Description	Comments	Treatment
Trees on	Elmridge Street			
442	3515 Elmridge	28" Live Oak	Ordinance tree	12' checkerplate, Zero curb cutback, Fence, Bore waterline, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
443	3515 Elmridge	12" Texas Red Oak	Private tree	Fence, Bore waterline, Demo-Form-Pour sidewalk without damage to roots > 1"
444	3515 Elmridge	22" Live Oak	Ordinance tree	8% slope to drive, 12' checkerplate, Zero curb cutback, Fence, Bore waterline, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
445	3511 Elmridge	25" Live Oak	Private tree	Zero curb cutback, Fence, Bore waterline, Demo-Form-Pour sidewalk without damage to roots > 1"
446	3511 Elmridge	20" Crepe Myrtle	Ordinance tree	Zero curb cutback, Fence, Bore waterline, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
447	3511 Elmridge	20" Crepe Myrtle	Ordinance tree	Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
448	3534 Elmridge	43" Water Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
449	Not available	28" Water Oak	Interior stripped out, Private tree	Root prune for sidewalk, Fence, Clearance prune
450	Not available	3" Crepe Myrtle	Not ordinance tree	
451	3526 Elmridge	26" Water Oak	Interior stripped out, Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
452	3526 Elmridge	27" Water Oak	50% Ike damage, Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
453	3522 Elmridge	25" Live Oak	Ordinance tree	12' checkerplate, Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
454	3522 Elmridge	23" Live Oak	Ordinance tree	12' checkerplate, Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
455	Not available	17" Live Oak	Private tree	Root prune for sidewalk, Fence, Clearance prune
456	Not available	27" Water Oak	30% Ike damage, Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
457	3514 Elmridge	34" Live Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
458	3514 Elmridge	36" Live Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
459	3510 Elmridge	1" Live Oak	Private tree, will not be impacted	
460	3510 Elmridge	2" Live Oak	Private tree, will not be impacted	
461	3502 Elmridge	25" Pine	Utility pruned, Private tree, will not be impacted	
462	3502 Elmridge	6" Crepe Myrtle	Not ordinance tree	
463	3502 Elmridge	6" Crepe Myrtle	Not ordinance tree	
464	3507 Elmridge	25" Live Oak	Private tree	Root prune for street, Fence, Bore waterline, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
465	3507 Elmridge	26" Live Oak	Private tree	Root prune for street, Fence, Bore waterline, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
466	3503 Elmridge	2" Nuttal Oak	Private tree, will not be impacted	
467	3503 Elmridge	2" Nuttal Oak	Private tree, will not be impacted	

MK.	DESCRIPTION	DATE	DWN.	CHK.

REVISIONS

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SURVEYED BY:
Landtech Consultants, Inc.
FB NO. 5543

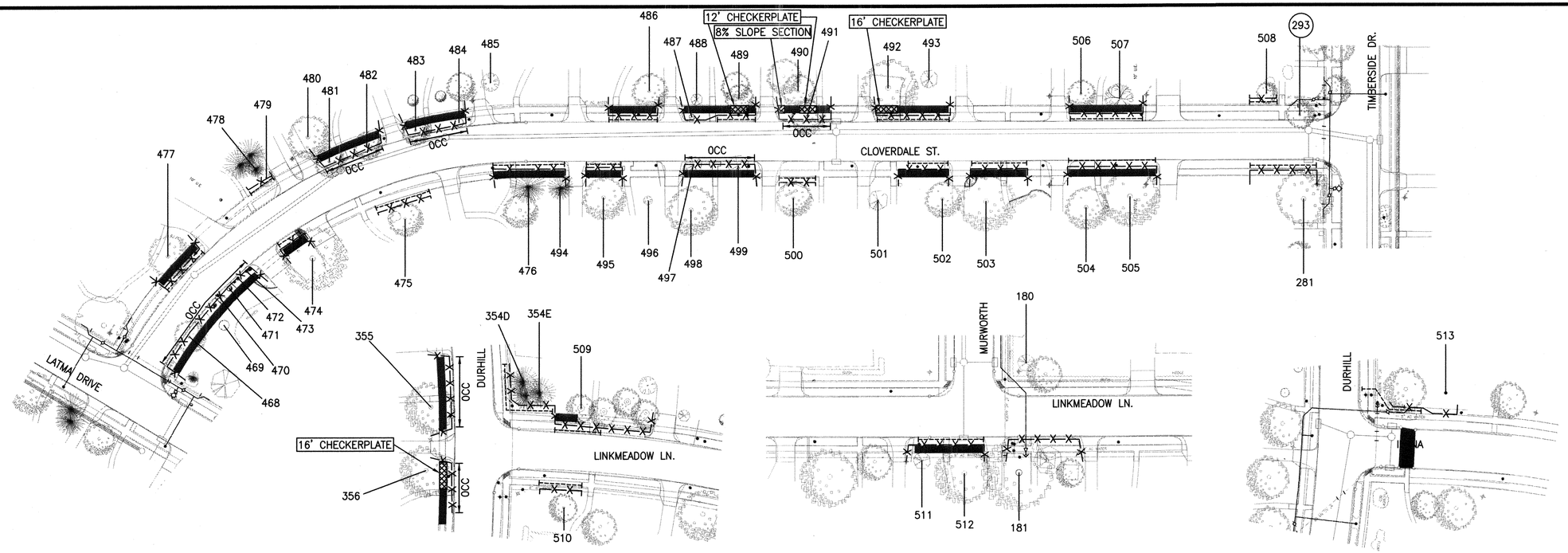
Job No.: 09-051 | Dwn By: NB
Date: April 2010 | Chkd By: C.N.K.

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

TREE PROTECTION PLAN
SHEET 6 OF 9

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	PUBLIC WORKS AND ENGINEERING — REVIEWED AND FILED — 48978 — LICENSE NUMBER — STATE OF TEXAS
DRAWING SCALE	
1"=40'	
CITY OF HOUSTON PM	
Mark Board, P.E.	
SHEET No: 103 OF 122	



Tree No.	Location	Description	Comments	Treatment
Trees on Cloverdale Street				
468	3530 Latma	17" Lacebark Elm	20% dieback, Ordinance tree	Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
469	3530 Latma	6" Water Oak	Ordinance tree	Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
470	3530 Latma	3" Japanese Black Pine	Not ordinance tree	
471	3530 Latma	4" Water Oak	Ordinance tree	Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
472	3530 Latma	2" Juniper	Not ordinance tree	
473	3530 Latma	2" Juniper	Not ordinance tree	
474	3530 Latma	47" Arizona Ash	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
475	3611 Cloverdale	22" Live Oak	Private tree	Root prune for sidewalk, Fence, Clearance prune
476	3607 Cloverdale	16" Pine	Ordinance tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
477	3602 Latma	25" Arizona Ash	Dieback, Ordinance tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
478	3618 Cloverdale	10" Pine	Private tree	Fence, Root prune for sidewalk
479	3618 Cloverdale	8" Crepe Myrtle	Not ordinance tree	Clearance prune
480	3614 Cloverdale	34" Live Oak	Private tree	Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
481	3614 Cloverdale	25" Live Oak	Ordinance tree	Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
482	3614 Cloverdale	15" Live Oak	Ordinance tree	Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
483	Not available	15" Live Oak	Ordinance tree	Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
484	Not available	19" Water Oak	Ordinance tree	Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
485	3606 Cloverdale	10" Crepe Myrtle	Private tree, will not be impacted	
486	3602 Cloverdale	29" Live Oak	30% dieback, Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
487	3526 Cloverdale	4" Crepe Myrtle	Not ordinance tree	
488	3526 Cloverdale	8" Magnolia	Ordinance tree	Demo-Form-Pour sidewalk without damage to roots > 1", Fence, Clearance prune
489	3526 Cloverdale	17" Water Oak	Ordinance tree	12' checkerplate, Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
490	3526 Cloverdale	17" Willow Oak	Private tree	Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
491	3526 Cloverdale	15" Live Oak	Ordinance tree	8% slope to drive, 16' checkerplate, Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
492	3518 Cloverdale	39" Live Oak	Private tree	16' checkerplate, Root prune for street, Demo-Form-Pour sidewalk without damage to roots > 1", Fence, Clearance prune
493	3518 Cloverdale	9" Magnolia	Private tree, will not be impacted	
494	3607 Cloverdale	12" Pine	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
495	3603 Cloverdale	21" Live Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
496	3603 Cloverdale	4" Crepe Myrtle	Private tree, will not be impacted	
497	3527 Cloverdale	10" Magnolia	30% dieback, Ordinance tree	Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
498	3527 Cloverdale	29" Live Oak	Private tree	Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
499	3527 Cloverdale	13" Magnolia	20% dieback, Ordinance tree	Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
500	3523 Cloverdale	25" Live Oak	35% dieback, Private tree	Root prune for sidewalk, Fence, Clearance prune
501	3523 Cloverdale	11" Magnolia	Private tree, will not be impacted	
502	3519 Cloverdale	28" Live Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
503	3515 Cloverdale	35" Live Oak	Interior stripped out, Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
504	3511 Cloverdale	34" Live Oak	Private tree, will not be impacted	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
505	3511 Cloverdale	39" Live Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
506	3590 Cloverdale	16" Shumard Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
507	3590 Cloverdale	12" Montezuma Cypress	Ordinance tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
508	9126 Timberside	12" Lacebark Elm	Private tree	Fence, Root prune for sidewalk
Trees on Linkmeadow Lane				
509	9026 Linkmeadow	16" Live Oak	Ordinance tree	Root prune for sidewalk, Fence, Clearance prune
510	9027 Linkmeadow	14" Lacebark Elm	15% dieback, Private tree	Fence, Root prune for sidewalk
511	3923 Linkmeadow	9" Magnolia	Ordinance tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
512	3923 Linkmeadow	31" Live Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
513	3606 Durhill	19" Live Oak	Private tree	Root prune for sidewalk, Fence, Clearance prune

TREE PRESERVATION PLAN LEGEND

- 1 — TREE NUMBER/LOCATION
- (1) — TREE TO BE REMOVED
- -X-X- — TREE PROTECTION FENCE
- ROOT PRUNING TRENCH
- REPLACEMENT PLANTING SPECIES AND SIZE/TYPE
- 0CC — ZERO CUTBACK CURB
- DEMO, FORM, POUR WALK WITHOUT DAMAGE TO ROOTS 1" OR LARGER
- CHECKERPLATE SECTION
- 8% SLOPE SECTION

NOTE:
THIS TREE PROTECTION PLAN WAS DEVELOPED WITH INFORMATION PROVIDED BY DESIGN ENGINEER IN DRAWINGS DATED JULY 2011. THE PLAN CONSIDERS ALL FITTINGS, VERTICAL OFFSETS AND AREAS OF NECESSARY EXCAVATION. CHANGES MADE TO DESIGN MAY COMPROMISE THE TREE PROTECTION PLAN. REFER SPECIFICATIONS 01562 AND 02915. CONDITION OF EACH TREE IS BASED ON VISUAL EVALUATION AT TIME OF DESIGN. CONDITION AND STRUCTURAL INTEGRITY OF EACH TREE IS NOT GUARANTEED BY DESIGNER AT ANY POINT IN THE FUTURE, AS ENVIRONMENTAL AND MAINTENANCE INFLUENCES ON EACH TREE CAN NOT BE DETERMINED BY DESIGNER.

MK.	DESCRIPTION	DATE	DWN.	CHK.

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SURVEYED BY:
Landtech Consultants, Inc.
FB NO. 5543

Job No.: 09-051 | Dwn By: NB
Date: April 2010 | Chkd By: C.N.K.

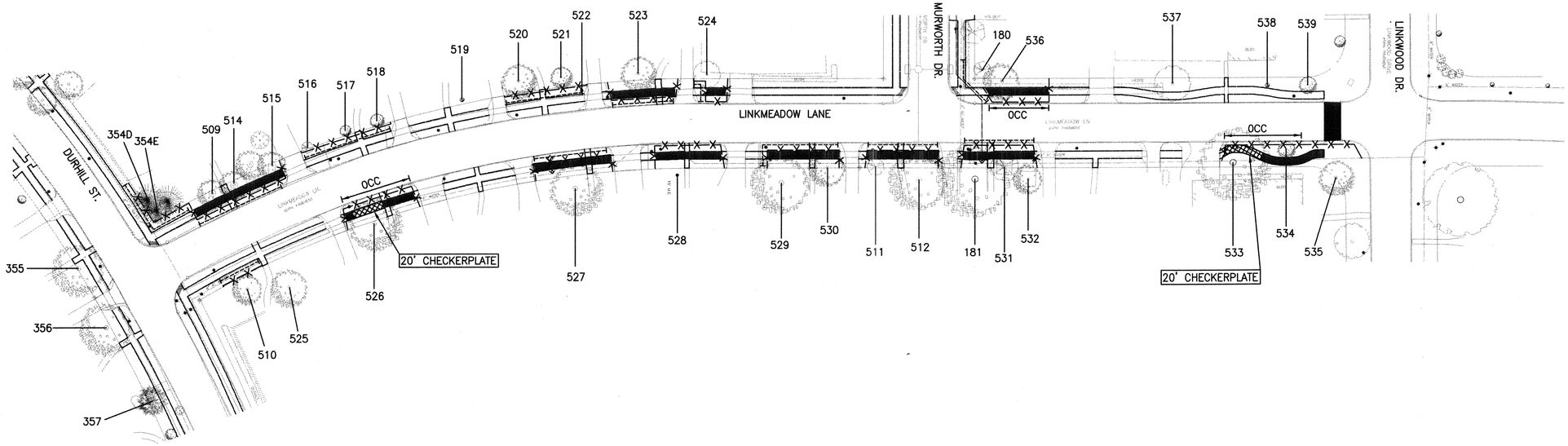
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

TREE PROTECTION PLAN
SHEET 7 OF 9

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	
DRAWING SCALE	
1"=40'	
CITY OF HOUSTON PM	
Mark Board, P.E.	
SHEET No: 104 OF 122	

PUBLIC WORKS AND ENGINEERING — ACCEPTED AND FILED — 48978 — LICENSE NUMBER — STATE OF TEXAS



Tree No.	Location	Description	Comments	Treatment
Trees on Linkmeadow Lane				
509	9026 Linkmeadow	16" Live Oak	Ordinance tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
510	9027 Linkmeadow	14" Lacebark Elm	15% dieback, Private tree	Fence, Root prune for sidewalk
511	3923 Linkmeadow	9" Magnolia	Ordinance tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
512	3923 Linkmeadow	31" Live Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
513	3606 Durhill	19" Live Oak	Private tree	Root prune for sidewalk, Fence, Clearance prune
514	9026 Linkmeadow	17" Live Oak	Ordinance tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
515	9026 Linkmeadow	12" Water Oak	Ordinance tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
516	9026 Linkmeadow	8" Magnolia	Private tree	Fence, Root prune for sidewalk
517	9022 Linkmeadow	9" Live Oak	Private tree	Fence, Root prune for sidewalk
518	9022 Linkmeadow	10" Live Oak	Private tree	Fence, Root prune for sidewalk
519	9018 Linkmeadow	3" Arizona Ash	Private tree, will not be impacted	
520	9014 Linkmeadow	25" Live Oak	Private tree	Root prune for sidewalk, Fence, Clearance prune
521	9014 Linkmeadow	13" Shumard Oak	Private tree	Fence, Root prune for sidewalk
522	9014 Linkmeadow	4" Crepe Myrtle	Not ordinance tree	Clearance prune
523	9010 Linkmeadow	27" Live Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
524	3703 Murworth	20" Lacebark Elm	Private tree	Root prune for manhole, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
525	9027 Linkmeadow	26" Lacebark Elm	Private tree, will not be impacted	
526	9023 Linkmeadow	45" Live Oak	Private tree	20' checkerplate, zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
527	9015 Linkmeadow	44" Water Oak	20% dieback, Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1", Clearance prune
528	9011 Linkmeadow	28" Live Oak	Private tree	Demo-Form-Pour sidewalk without damage to roots > 1", Fence
529	9007 Linkmeadow	37" Willow Oak	40% dieback, Private tree	Root prune for yard drain and street, Fence, Demo-Form-Pour sidewalk without damage to roots >1", Fence
530	9007 Linkmeadow	27" Willow Oak	60% dieback, Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
531	8915 Linkmeadow	12" Magnolia	Ordinance tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
532	8915 Linkmeadow	22" Water Oak	Private tree	Root prune for street, Fence, Demo-Form-Pour sidewalk without damage to roots > 1"
533	Not available	43" Willow Oak	Dieback, Ordinance tree	Zero curb cutback, Fence, Clearance prune, Demo-Form-Pour sidewlak without damage to roots > 1", 20' checkerplate
534	Not available	10" Pecan	Ordinance tree	Zero curb cutback, Fence, Clearance prune, Demo-Form-Pour sidewalk without damage to roots > 1"
535	Not available	19" Pecan	Private tree	Fence
536	3702 Murworth	25" Winged Elm	Ordinance tree	Root prune for waterline, Zero curb cutback, Fence, Demo-Form-Pour sidewalk without damage to roots >1", Clearance prune
537	Not available	10" Crepe Myrtle	Not ordinance tree	Clearance prune
538	Not available	2" Bradford Pear	Not ordinance tree	
539	Not available	10" Bradford Pear	Not ordinance tree	Clearance prune

TREE PRESERVATION PLAN LEGEND

- 1 — TREE NUMBER/LOCATION
- (1) — TREE TO BE REMOVED
- —X—X— TREE PROTECTION FENCE
- ROOT PRUNING TRENCH
- REPLACEMENT PLANTING SPECIES AND SIZE/TYPE
- OCC — ZERO CUTBACK CURB
- DEMO, FORM, POUR WALK WITHOUT DAMAGE TO ROOTS 1" OR LARGER
- CHECKERPLATE SECTION
- 8% SLOPE SECTION

NOTE:
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FB NO. 5543

Job No.: 09-051	Dwn By: NB
Date: April 2010	Chkd By: C.N.K.

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

TREE PROTECTION PLAN
SHEET 8 OF 9

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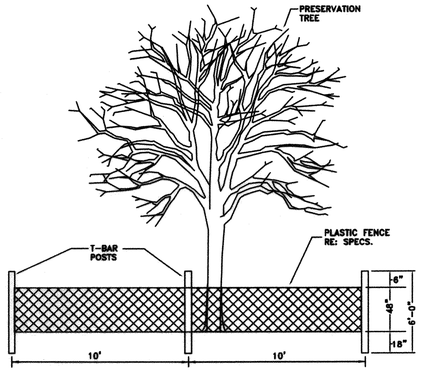
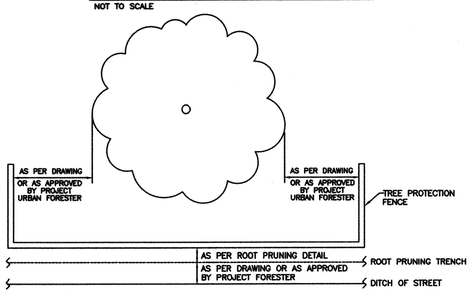
1"=40'	
CITY OF HOUSTON PM	
Mark Board, P.E.	
SHEET No: 105 OF 122	

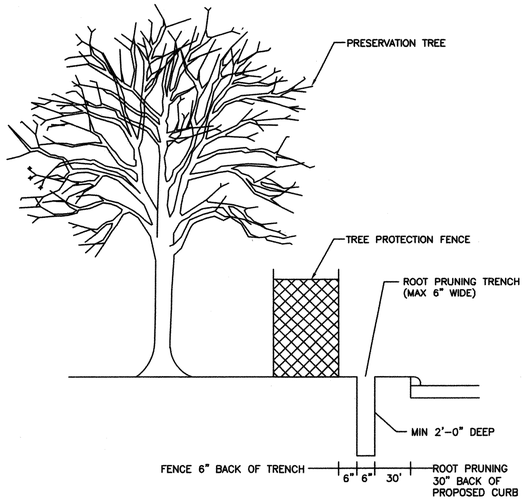
PUBLIC WORKS AND ENGINEERING — REVIEWED AND FILED — 48978 — LICENSED — TEXAS



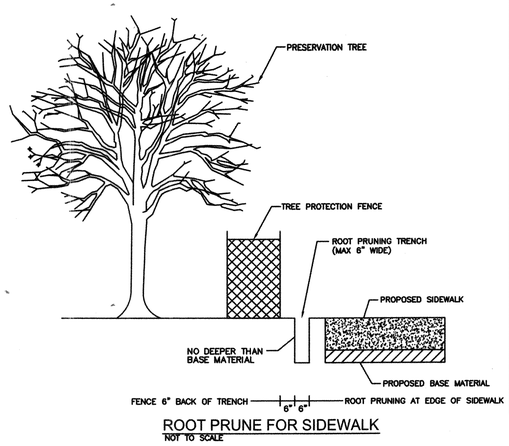
TREE PROTECTION FENCING DETAIL A
NOT TO SCALE



TREE PROTECTION FENCING DETAIL B
NOT TO SCALE



ROOT PRUNE FOR STREET-CURB & GUTTER - NO 0CC
NOT TO SCALE

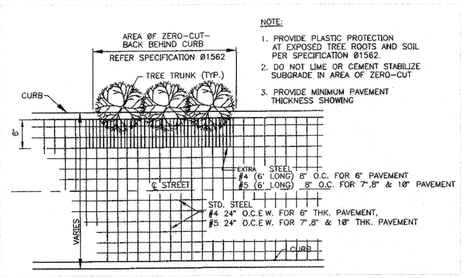


ROOT PRUNE FOR SIDEWALK
NOT TO SCALE

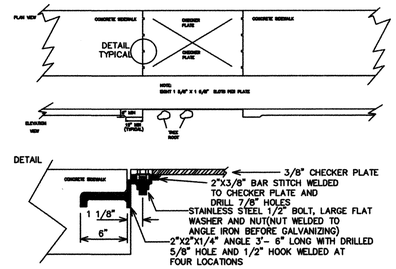
Tree Removal List			
Tree No.	Location	Description	Replacement requirement
28	3802 Latma	13" Pine	13
29	3802 Latma	10" Pine	10
45	3722 Latma	18" Sugarberry	0
90	Not available	3" Shumard Oak	3
91	Not available	6" Shumard Oak	6
260	3711 Murworth	13" Sycamore	0
261	3711 Murworth	15" Sycamore	0
293	9126 Timberside	13" Live Oak	13
300	3502 Elmridge	17" Live Oak	17
358	3611 Durhill	9" Crepe Myrtle	0
439	3527 Elmridge	(6)5" Raintree	0
		TOTAL REPLACEMENT INCHES REQUIRED	62

Tree Replacement List			
Quantity	Caliper Size	Species	Container/Tree Spade size
2	3	Live Oak (Quercus virginiana)	60" spade or cured basket
2	3	Loblolly Pine (Pinus taeda)	60" spade or cured basket
2	3	Mexican Sycamore (Paltunus mexicana)	65 gallon container
15	3	Polymorpha Oak (Quercus polymorpha)	60" spade or cured basket
TOTAL REPLACEMENT INCHES INCLUDED IN PLAN			63

NOTE: Tree replacement locations shown on plans must be coordinated with adjacent property owner and City of Houston Urban Forestry prior to excavation for planting. Coordination shall be completed by construction contractor's Certified Arborist.

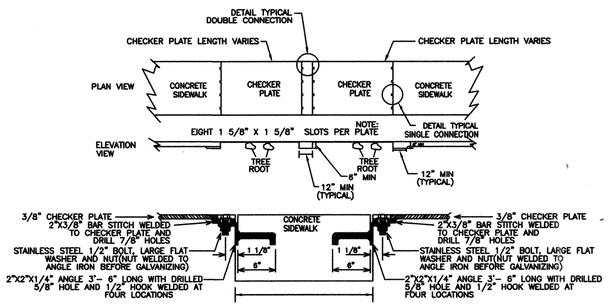


ZERO CURB CUTBACK DETAIL
EXTRA STEEL BEHIND CURB
NOT TO SCALE



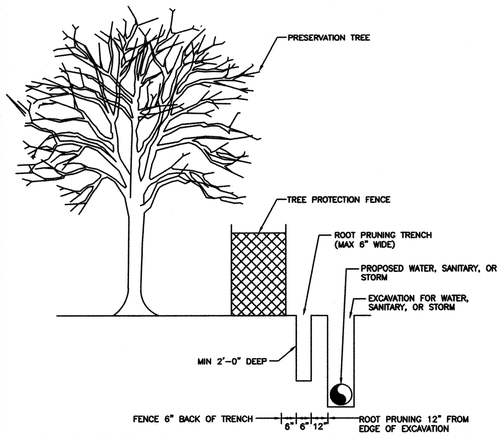
CHECKERPLATE DETAIL-SINGLE CONNECTION
NOT TO SCALE

NOTE:
ALL IRONWORK TO BE HOT DIPPED GALVINIZED EXCEPT AS NOTED.

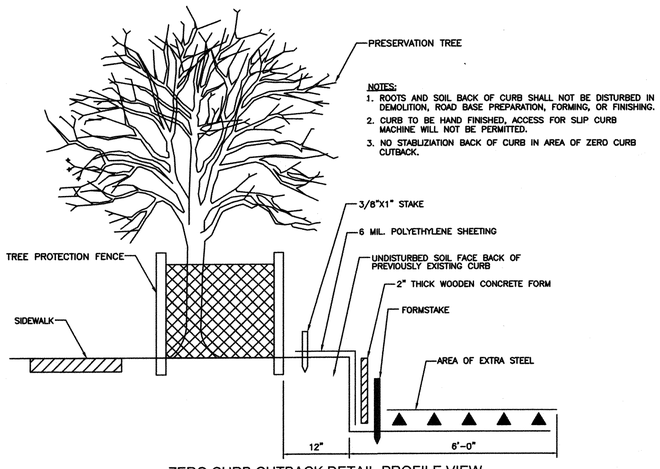


CHECKERPLATE DETAIL-DOUBLE CONNECTION
NOT TO SCALE

NOTE:
ALL IRONWORK TO BE HOT DIPPED GALVINIZED EXCEPT AS NOTED.



ROOT PRUNE FOR WATER, SANITARY, OR STORM LINE
NOT TO SCALE



ZERO CURB CUTBACK DETAIL-PROFILE VIEW
NOT TO SCALE

MK.	DESCRIPTION	DATE	DWN.	CHK.

REVISIONS

HDR | CLAUNCH & MILLER
Engineering Consultants
4635 Southwest Freeway, Suite 1000 ♦Houston, Texas 77027
(713) 622-9264 ♦Fax (713) 622-9265 ♦www.hdrinc.com
HDR Engineering Inc. Texas Reg. No. F-754

PARK AND RECREATION

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Urban Forestry, Inc.
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281-391-0022 cnkoehl@koehlurbanforestry.com
APPROVED: C.N. Koehl 10/13/11

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SURVEYED BY:
Landtech Consultants, Inc.
FB NO. 5543

Job No.: 09-051 | Dwn By: N.B.
Date: April 2010 | Chkd By: C.N.K.

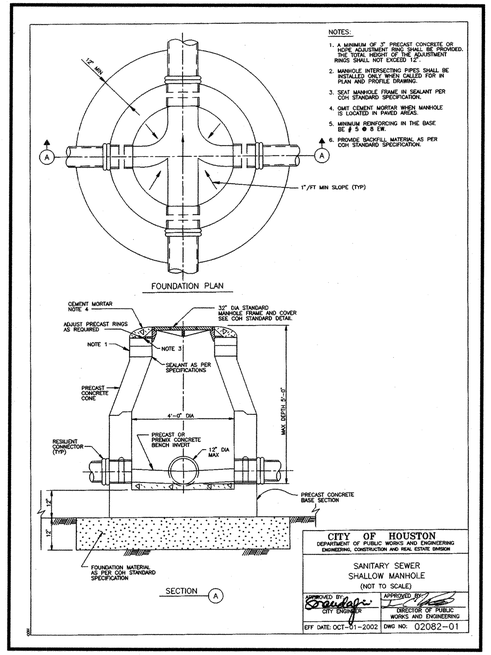
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

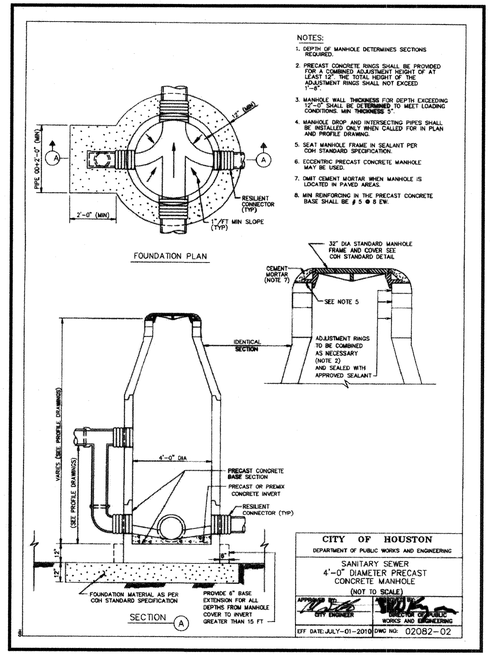
City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

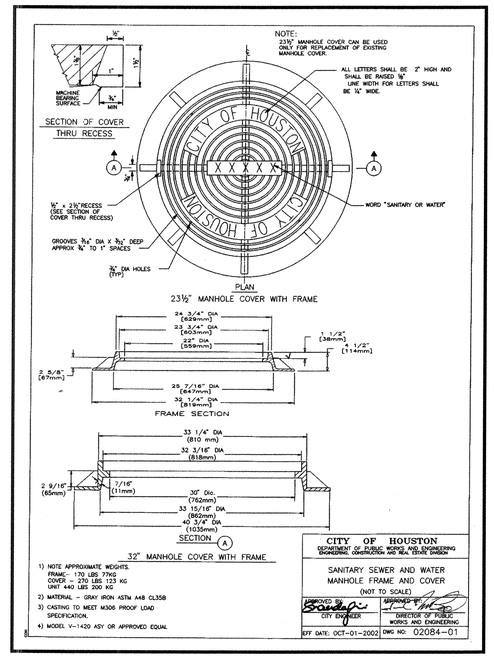
TREE PROTECTION PLAN
SHEET 9 OF 9

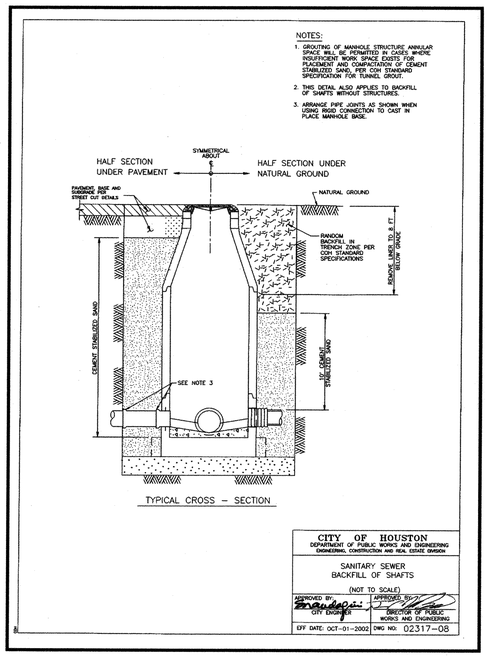
WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	PUBLIC WORKS AND ENGINEERING — ACCEPTED AND FILED — 48978 — TEXAS
DRAWING SCALE	
1"=40'	
CITY OF HOUSTON PM	
Mark Board, P.E.	
SHEET No: 106 OF 122	

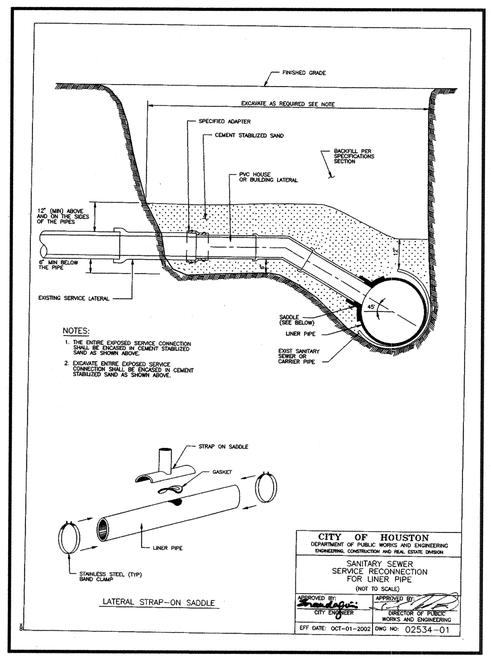
AB

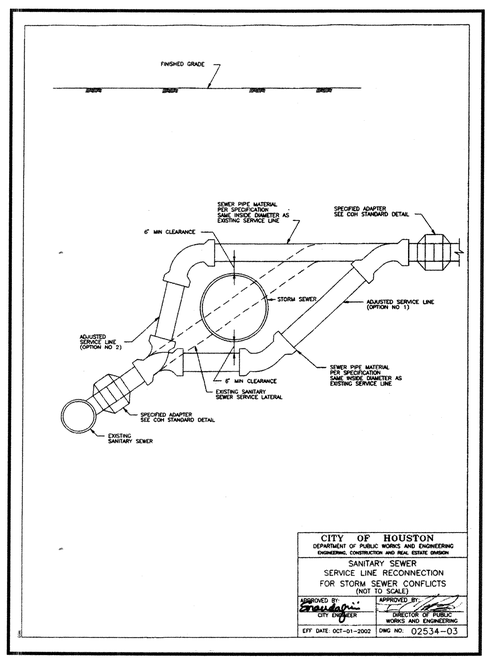












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SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

STATE OF TEXAS
JOHN D. RUDLOFF
93386
LICENSED
PROFESSIONAL ENGINEER
10/9/11

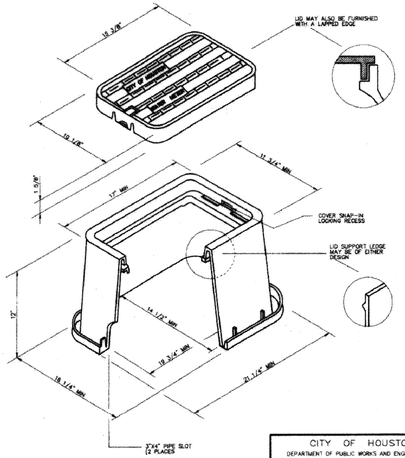
Job No.: 09-051	Dwn By: F. Redburn
Date: May 2011	Chkd By: D. Jorgensen

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Sanitary Sewer Details

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	PUBLIC WORKS AND ENGINEERING — APPROVED AND FILED — 48978 — NUMBER — TEXAS
DRAWING SCALE	
VERT: NA HORZ: NA	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	
SHEET No: 107 OF 122	

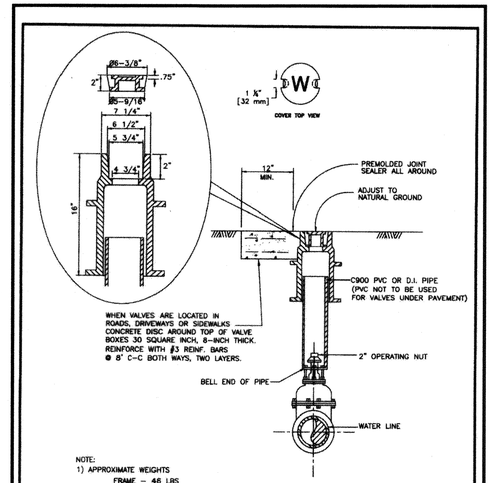


NOTE
1. LID MUST BE ABLE TO ACCEPT THE CITY'S AMR TRANSMITTING ENDPOINT.

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

STANDARD PLASTIC METER BOX FOR ¾" AND 1" METERS
(NOT TO SCALE)

APPROVED: CITY ENGINEER — DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JUL-01-2010 DWG NO 02085-01

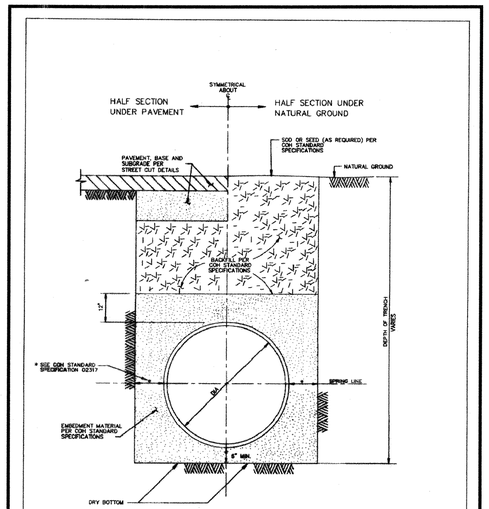


NOTE:
1) APPROXIMATE WEIGHTS
FRAME – 48 LBS
COVER – 10 LBS
2) MATERIAL – GRAY IRON ASTM A48 CL35B

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

VALVE BOX DETAIL
(NOT TO SCALE)

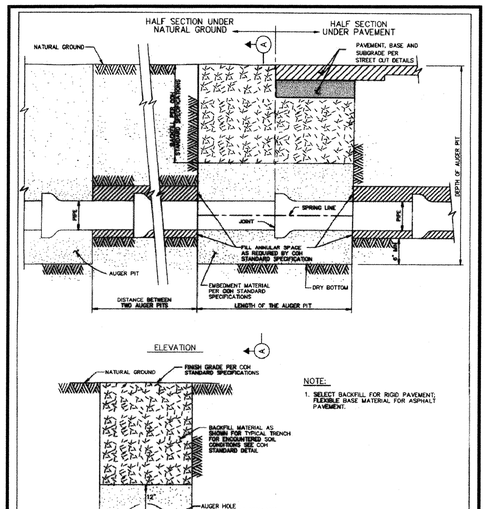
APPROVED: CITY ENGINEER — DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF. DATE: JULY 01, 2010 DWG. NO. 02085-03



CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER DISTRIBUTION MAIN BEDDING AND BACKFILL FOR OPEN CUT TRENCHES
(NOT TO SCALE)

APPROVED: CITY ENGINEER — DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JUL-01-2010 DWG NO. 02317-04



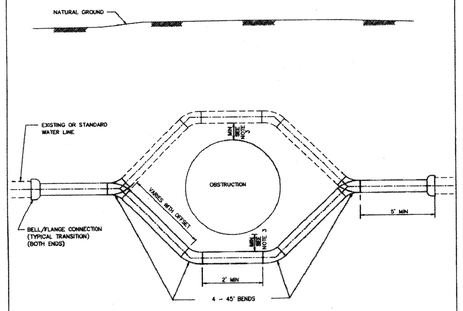
NOTE:
1. SELECT BACKFILL FOR RIGID PAVEMENT: FLEXIBLE BASE MATERIAL FOR ASPHALT PAVEMENT.

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

BEDDING AND BACKFILL AUGER PIT AND AUGER HOLE
(NOT TO SCALE)

APPROVED: CITY ENGINEER — DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JUL-01-2010 DWG NO. 02447-01

NOTE:
1. MATERIALS AND COATINGS TO BE IN ACCORDANCE WITH WATER LINE STANDARD SPECIFICATIONS.
2. RESTRAIN EXISTING PIPING BEYOND STEEL SECTION AS REQUIRED TO PREVENT MOVEMENT.
3. AS PER DESIGN GUIDELINE.



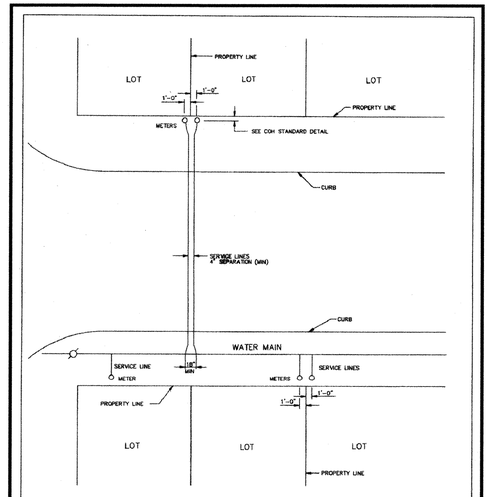
PIPE OFFSET ALTERNATES

1. DUCTILE IRON PIPE PRESSURE 250 PSI WITH APPROVED RESTRAINED JOINTS.
2. PVC PIPE WITH INTEGRAL RESTRAINED JOINT SYSTEM, OR DUCTILE – IRON RESTRAINED JOINT FITTINGS, EPOXY LINED AND COATED. USE 250 PSI AWWA C900 DR 14 FOR PVC RESTRAINED JOINTS.
3. PVC NOT ALLOWED FOR GREATER THAN 20 FT. OF COVER OR FOR DIAMETER LARGER THAN 20 IN.
4. USE ONLY DUCTILE IRON AND PVC PRODUCTS LISTED ON OOE DIVISION APPROVED PRODUCTS LIST AND IN ACCORDANCE WITH CITY STANDARD SPECIFICATIONS.

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

TYPICAL STEEL PIPE OFFSET SECTION FOR WATER LINES
(NOT TO SCALE)

APPROVED: CITY ENGINEER — DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JULY-01-2010 DWG NO. 02511-01



GENERAL NOTES:
1. TWO SERVICE LINES MAY BE INSTALLED IN SAME TRENCH PROVIDING 4" CLEARANCE IS MAINTAINED.
2. ONE METER PER SERVICE LINE

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

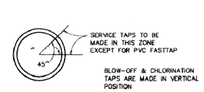
TYPICAL 3/4" THROUGH 2" SERVICE ARRANGEMENTS
(NOT TO SCALE)

APPROVED: CITY ENGINEER — DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JULY-01-2010 DWG NO: 02512-01

PIPE TAPPING SCHEDULE

WATER MAIN TYPE AND DIAMETER	SERVICE SIZE 3/4"	1"	1 1/2"	2"
4" CAST IRON OR DUCTILE IRON	DSS, WBSS	DSS, WBSS	DSS, WBSS	DSS, WBSS
4" ASBESTOS (EXISTING) CEMENT	WBSS	WBSS	DSS, WBSS	DSS, WBSS
4" PVC (AWWA C900)	DSS, WBSS	DSS, WBSS	DSS, WBSS	DSS, WBSS
6" AND 8" CAST IRON OR DUCTILE IRON	DSS, WBSS	DSS, WBSS	DSS, WBSS	DSS, WBSS
6" AND 8" ASBESTOS (EXISTING) CEMENT	DSS, WBSS	DSS, WBSS	DSS, WBSS	DSS, WBSS
6" AND 8" CAST IRON OR DUCTILE IRON	DSS, WBSS	DSS, WBSS	DSS, WBSS	DSS, WBSS
6" AND 8" PVC (AWWA C900)	DSS, WBSS	DSS, WBSS	DSS, WBSS	DSS, WBSS
12" CAST IRON OR DUCTILE IRON	DSS, WBSS	DSS, WBSS	DSS, WBSS	DSS, WBSS
12" ASBESTOS (EXISTING) CEMENT	DSS, WBSS	DSS, WBSS	DSS, WBSS	DSS, WBSS
12" PVC (AWWA C900)	DSS, WBSS	DSS, WBSS	DSS, WBSS	DSS, WBSS
16" AND UP CAST IRON OR DUCTILE IRON	DWBSS	DWBSS	DWBSS	DWBSS
16" AND UP ASBESTOS (EXISTING) CEMENT	DWBSS	DWBSS	DWBSS	DWBSS
16" AND UP PVC (AWWA C900)	DWBSS	DWBSS	DWBSS	DWBSS

DSS – DUAL STRAP SADDLES
WBSS – WIDE BAND STRAP SADDLES
DWBSS – DUAL WIDE BAND STRAP SADDLES



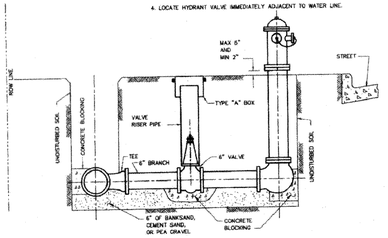


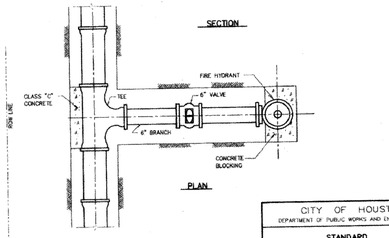
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

SERVICE TAPS
(NOT TO SCALE)

APPROVED: CITY ENGINEER — DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JUL-01-2010 DWG NO. 02512-02

NOTES:
1. LOCATE FIRE HYDRANTS AT PCs OF THE INTERSECTION CURB RADIUS, 3 FEET BEHIND CURB OR PROJECTED FUTURE CURB.
2. ON OPEN-DITCH ROADWAYS, SET THE FIRE HYDRANTS WITH IN 5 FEET OF RIGHTS-OF-WAY LINES.
3. FIRE HYDRANT STEAMER NOZZLE SHALL FACE THE STREET.
4. LOCATE HYDRANT VALVE IMMEDIATELY ADJACENT TO WATER LINE.





CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

STANDARD FIRE HYDRANT DETAIL
(NOT TO SCALE)

APPROVED: CITY ENGINEER — DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JULY-01-2010 DWG NO. 02520-01

MB

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HDR Engineering Inc. Texas Reg. No. F-754

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Fax (713) 622-9265

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

STATE OF TEXAS — JOHN D. RUDLOFF — 83386 — LICENSED PROFESSIONAL ENGINEER
10/19/11

Job No.: 09-051 | Dwn By: F. Redburn
Date: May 2011 | Chkd By: D. Jorgensen

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

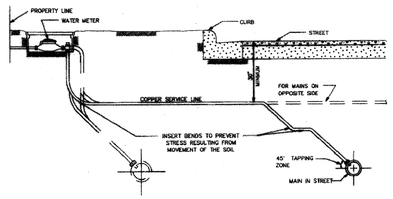
City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Water Line Details I

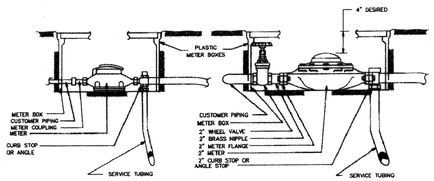
WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	
DRAWING SCALE	
VERT: NA HORZ: NA	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	

PUBLIC WORKS AND ENGINEERING — APPROVED — 48978 — LICENSED ENGINEER — TEXAS

NOTES:
1 1/2" METER SET IS SAME AS 2" EXCEPT WHEEL VALVE IS NOT REQUIRED.



TYPICAL SECTION SERVICE LINE



5/8", 3/4" AND 1" METER SET

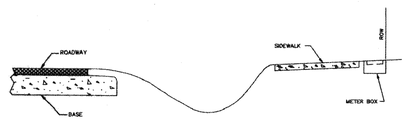
2" METER SET

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

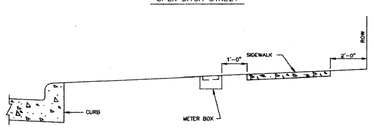
TYPICAL METER SETTINGS
(NOT TO SCALE)

APPROVED BY: CITY ENGINEER — APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING

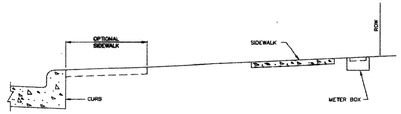
EFF DATE: JULY-01-2010 DWG NO: 02526-01



OPEN DITCH STREET



CURB STREET



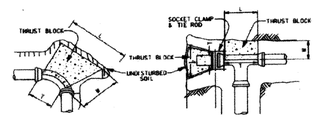
CURB STREET

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

LOCATION OF WATER METER BOX FOR 2" DIAMETER AND LESS

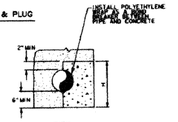
APPROVED BY: CITY ENGINEER — APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING

EFF DATE: JUL-01-2010 DWG NO: 02085-02



90° BEND
(45° BENDS SIMILAR)

TEE & PLUG



PIPE CROSS SECTION

MINIMUM BLOCKING DIMENSION IN INCHES

PIPE SIZE	90° BEND			45° BEND			TEE/PLUG			
	W	H	L	T	W	H	L	T	W	H	L	T
4"	8	12	14	10	6	8	11	8	6	10	12	12
6"	8	14	26	12	8	14	14	12	6	14	19	19
8"	10	16	40	16	10	18	20	16	10	18	26	26
10"	12	24	42	18	12	22	25	18	12	24	30	30
12"	14	36	60	30	14	26	30	22	14	26	40	40

CORRECTION FACTORS

SOIL TYPE	SOIL BEARING STRENGTH S_b (lb/ft²)	MULTIPLY "L" AND "H" BY
SOFT CLAY	1000	1.73
SILT	1500	1.41
SANDY SILT	3000	1.00
SAND	4000	0.87
SANDY CLAY	5000	0.71
HARD CLAY	9000	0.58

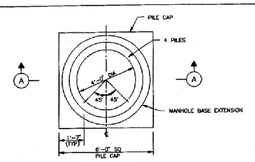
NOTES:
1. DEPTH "H" MAY BE GREATER THAN SPECIFIED TO ALLOW WORKING SPACE.
2. BLOCKING MUST BE PLACED AGAINST UNDISTURBED EARTH. WHERE THIS IS NOT POSSIBLE, THE FILL BETWEEN THE BEARING SURFACE AND UNDISTURBED SOIL MUST BE COMPACTED TO AT LEAST 90% STANDARD PROCTOR DENSITY.
3. PROVIDE CONCRETE IN ACCORDANCE WITH STANDARD SPECIFICATION SECTION 03315 - CONCRETE FOR UTILITY CONSTRUCTION.
4. BLOCKING DIMENSIONS SHOWN ARE BASED ON 3000 PSF SOIL BEARING STRENGTH AND 125 PSI INTERNAL WATER PRESSURE. FOR OTHER SOIL CONDITIONS, MULTIPLY DIMENSIONS "L" AND "H" BY THE APPROPRIATE CORRECTION FACTOR.

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

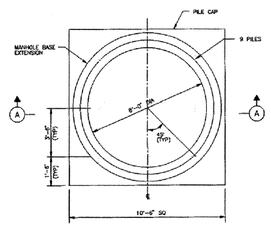
THRUST BLOCK DETAIL FOR WATER LINES (4-INCH TO 12 INCH)
(NOT TO SCALE)

APPROVED BY: CITY ENGINEER — APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING

EFF DATE: JULY-01-2010 DWG NO: 02511-02



6 PILE PLAN
4'-0" ID MANHOLE



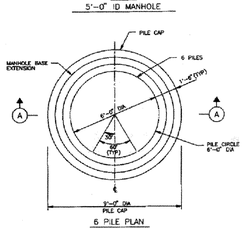
9 PILE PLAN
8'-0" ID MANHOLE

TABLE 1
PILE REQUIREMENTS

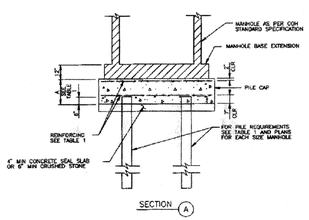
MANHOLE ID (FT)	NUMBER OF PILES	DEPTH TO INVERT (FT)	CAPACITY/ PILE (TONS) MINIMUM	PILE CAP DEPTH A (FT)	PILE CAP REINF. (EW, TBE)
4	4	10	9	1'-6"	# 6 @ 6"
		12	10		
		15	11		
		20	13		
		25	15		
		30	17		
5	5	10	10	1'-6"	# 8 @ 8"
		12	11		
		15	12		
		20	13		
		25	17		
		30	20		
6	6	10	9	2'-0"	# 6 @ 6"
		12	10		
		15	12		
		20	15		
		25	17		
		30	20		
8	9	10	8	2'-0"	# 7 @ 6"
		12	9		
		15	10		
		20	13		
		25	16		
		30	18		

NOTES:
1. PILING SUPPORT SHALL BE INSTALLED AT ALL LOCATIONS WHERE BEARING SUBGRADE CONDITIONS ARE LIKELY TO OCCUR, AS DETERMINED BY THE CITY ENGINEER.
2. THE CITY ENGINEER WILL PROVIDE THE SIZE, LENGTH, AND MATERIAL OF PILE NEEDED TO ENSURE THE CAPACITY SHOWN ON TABLE 1 BASED ON ACTUAL CONDITIONS REVEALED AT TIME OF CONSTRUCTION.

NOTES TO SPECIFIER:
1. INCLUDE THIS DETAIL ONLY IF THE GEOTECHNICAL REPORT INDICATES THAT AN UNSTABLE FOUNDATION (ONE WHICH WILL NOT ALLOW COMPACTION AND/OR DEWATERING AS SPECIFIED) IS POSSIBLE. IF THIS CONDITION IS REPORTED BY THE GEOTECHNICAL ENGINEER, NOTIFY THE CITY'S PROJECT MANAGER.
2. ALWAYS INCLUDE COMPANION STANDARD DETAIL DRAWING CRUSHED STONE SUPPORTED MANHOLE FOR UNSTABLE SUBGRADE WITH THIS DETAIL.
3. WHERE SOIL BORINGS ARE MADE AT MANHOLE LOCATIONS AND THE GEOTECHNICAL ENGINEER BELIEVES THAT THE CONDITIONS REVEALED THERE ARE REPRESENTATIVE OF THE ENTIRE MANHOLE LOCATION AND THAT PILE SUPPORTED MANHOLES ARE NOT REQUIRED, THE GEOTECHNICAL ENGINEER SHOULD NOTIFY THE CITY'S PROJECT MANAGER. NOTIFY HIM THAT THE SOIL INFORMATION PROVIDED MAY NEED TO BE ADJUSTED OR THE PILES ELIMINATED AND THAT OTHER MANHOLE LOCATIONS (NOT SHOWN AS PILE SUPPORTED MAY NEED PILES DEPENDING ON ACTUAL CONDITIONS UNCOVERED.
4. PROVIDE APPROPRIATE PILE SPECIFICATIONS.



6 PILE PLAN
6'-0" ID MANHOLE



SECTION (A)

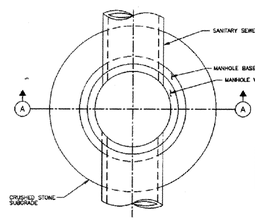
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
ENGINEERING, CONSTRUCTION AND REAL ESTATE DIVISION

SANITARY SEWER
PILE SUPPORTED MANHOLE FOR UNSTABLE SUBGRADE
(NOT TO SCALE)

APPROVED BY: CITY ENGINEER — APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING

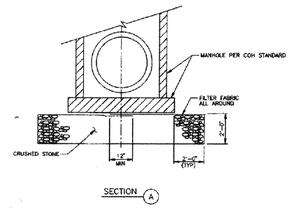
EFF DATE: OCT-01-2002 DWG NO: 02082-04

NOTES:
1. CRUSHED STONE SUPPORT UNDER A MANHOLE BASE SHALL BE INSTALLED AT LOCATIONS WHERE REQUIRED SUBGRADE COMPACTION OR DEWATERING CANNOT BE ACHIEVED.
2. WHERE BEARING SUBGRADE CONDITIONS OCCUR, AS DETERMINED BY THE CITY ENGINEER, A PILE SUPPORTED MANHOLE SHALL BE PROVIDED.



PLAN

NOTE TO SPECIFIER:
1. INCLUDE THIS DETAIL ONLY IF THE GEOTECHNICAL REPORT INDICATES THAT AN UNSTABLE FOUNDATION (ONE WHICH WILL NOT ALLOW COMPACTION AND/OR DEWATERING AS SPECIFIED) IS POSSIBLE. IF THIS CONDITION IS REPORTED BY THE GEOTECHNICAL ENGINEER, NOTIFY THE CITY'S PROJECT MANAGER.
2. ALWAYS INCLUDE COMPANION STANDARD DETAIL FOR PILE SUPPORTED MANHOLE FOR UNSTABLE SUBGRADE WITH THIS DETAIL. IF GEOTECHNICAL REPORT INDICATES BEARING SUBGRADE IS LIKELY.



SECTION (A)

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

SANITARY SEWER
CRUSHED STONE SUPPORTED MANHOLE FOR WET STABLE TRENCH
(NOT TO SCALE)

APPROVED BY: CITY ENGINEER — APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING

EFF DATE: OCT-01-2002 DWG NO: 02082-05

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Fax (713) 622-9265

STATE OF TEXAS — JOHN D. RUDLOFF — 83386 — LICENSED PROFESSIONAL ENGINEER — 10/9/11

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 — Dwn By: F. Redburn
Date: May 2011 — Chkd By: D. Jorgensen

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Sanitary Sewer &
Water Line Details II

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	
DRAWING SCALE	
VERT: NA HORZ: NA	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	
SHEET No: 109 OF 122	

PUBLIC WORKS AND ENGINEERING — ANTI FILED — 48978 — NUMBER — TEXAS

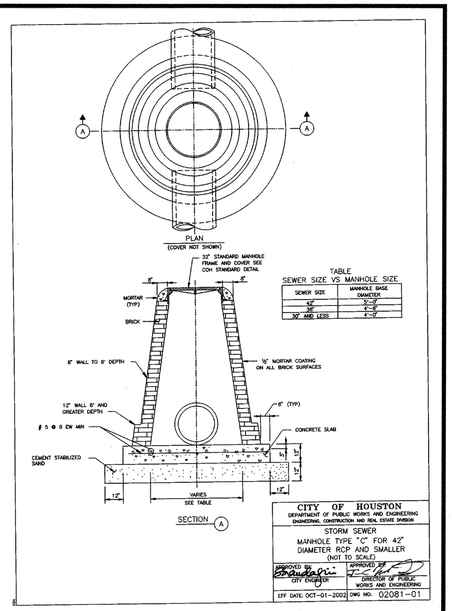


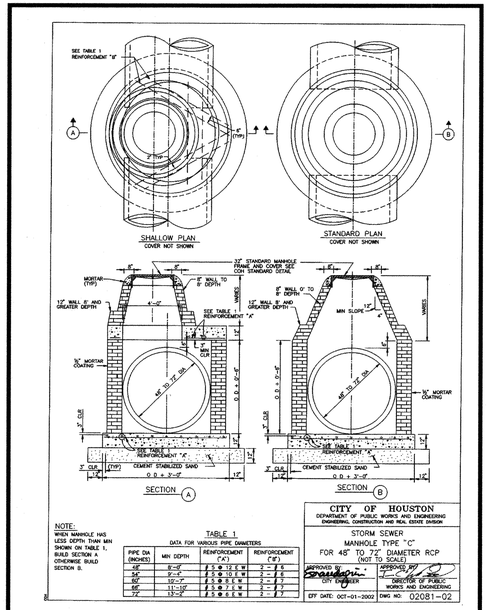
TABLE
SEWER SIZE VS MANHOLE SIZE

SEWER SIZE	MANHOLE BASE DIAMETER
24"	5'-0"
30"	6'-0"
36" AND LESS	6'-0"

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

STORM SEWER
MANHOLE TYPE "C" FOR 42" DIAMETER RCP AND SMALLER
(NOT TO SCALE)

APPROVED BY: CITY ENGINEER — APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF. DATE: OCT-01-2002 — DWG NO: 02081-01



NOTE:
WHEN MANHOLE HAS LESS DEPTH THAN MH SHOWN ON TABLE 1, BUILD SECTION A OTHERWISE BUILD SECTION B.

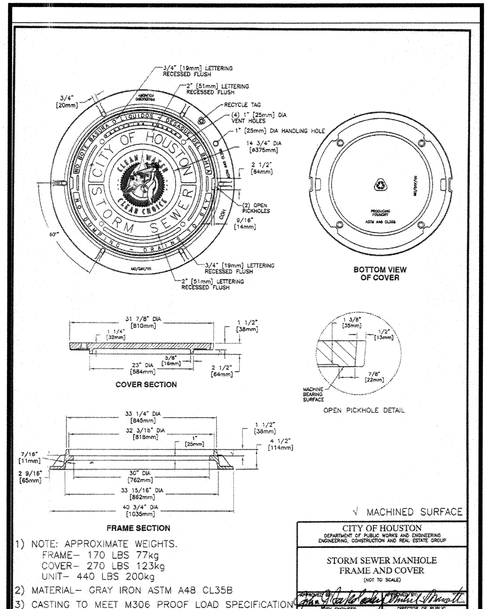
TABLE 1
DATA FOR VARIOUS PIPE DIAMETERS

PIPE DIA (INCHES)	MIN DEPTH	REINFORCEMENT ("A")	REINFORCEMENT ("B")
18"	8'-0"	# 5 @ 12 E W	2 - # 5
24"	9'-0"	# 5 @ 10 E W	2 - # 5
30"	10'-0"	# 5 @ 8 E W	2 - # 5
36"	11'-10"	# 5 @ 7 E W	2 - # 5
72"	13'-0"	# 5 @ 6 E W	2 - # 5

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

STORM SEWER
MANHOLE TYPE "C"
FOR 48" TO 72" DIAMETER RCP
(NOT TO SCALE)

APPROVED BY: CITY ENGINEER — APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF. DATE: OCT-01-2002 — DWG NO: 02081-02



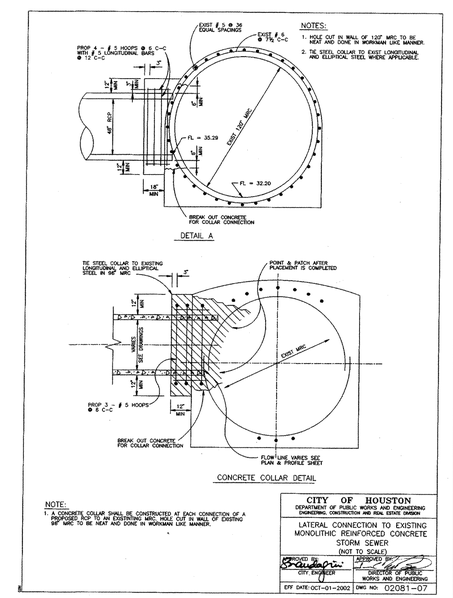
√ MACHINED SURFACE

1) NOTE: APPROXIMATE WEIGHTS.
FRAME– 170 LBS 77kg
COVER– 270 LBS 123kg
UNIT– 440 LBS 200kg
2) MATERIAL– GRAY IRON ASTM A48 CL35B
3) CASTING TO MEET M306 PROOF LOAD SPECIFICATION
4) EJIW V-1420 ASY OR APPROVED EQUAL

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

STORM SEWER MANHOLE
FRAME AND COVER
(NOT TO SCALE)

CITY ENGINEER — DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF. DATE: 04-01-07 — DWG. NO. 02084-02



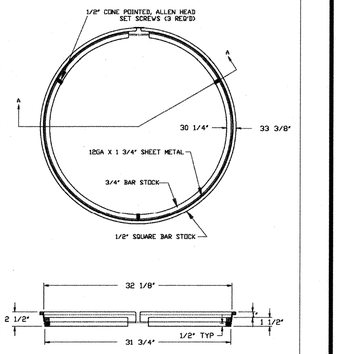
NOTE:
1. A CONCRETE COLLAR SHALL BE CONSTRUCTED AT EACH CONNECTION OF A PROPOSED RCP TO AN EXISTING MRC. HOLE CUT IN WALL OF EXISTING 48" MRC TO BE NEAT AND DONE IN WORKMAN LIKE MANNER.

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

LATERAL CONNECTION TO EXISTING MONOLITHIC REINFORCED CONCRETE STORM SEWER
(NOT TO SCALE)

CITY ENGINEER — DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: OCT-01-2002 — DWG NO: 02081-07

NOTES:
1.) MATERIAL SHALL MEET OR EXCEED MINIMUM REQUIREMENTS OF ASTM A36 CARBON STEEL.
2.) TOP AND BOTTOM RINGS SHALL HAVE A CONTINOUS WELD.
3.) ALL "MB" STYLE RISERS ARE FOR HEIGHT ADJUSTMENTS EQUAL TO OR LESS THAN THE THICKNESS OF THE MANHOLE COVER.
4.) EACH RISER IS CUSTOM FABRICATED FROM MEASUREMENTS PROVIDED WITH EACH ORDER. REQUIRED MEASUREMENTS INCLUDE THE FOLLOWING:
A. EXIST. MANHOLE COVER DIAMETER - TOP & BOTTOM
B. EXISTING MANHOLE COVER THICKNESS
C. REQUIRED HEIGHT OF ADJUSTMENT
5.) MINIMUM RECOMMENDED HEIGHT OF ADJUSTMENT FOR REPAVING PROJECTS IS 1".
6.) HEIGHT ADJUSTMENTS ARE AVAILABLE IN 1/4" INCREMENTS.
7.) DURING INSTALLATION CHECK FOR FULL BEARING OF LOWER FRAME SECTION ON EXISTING CASTING.
8.) DIMENSIONS MAY VARY TO MEET EXISTING FIELD CONDITIONS. ANY CHANGE IN DIMENSIONS SHALL BE APPROVED BY THE OWNER.
9.) AFTER FABRICATION, RISERS ARE COATED WITH EITHER A WATER BASED BITUMINOUS ASPHALT EMULSION PAINT OR BASF E-COAT W/ CHARCOAL BLACK TOPCOAT.

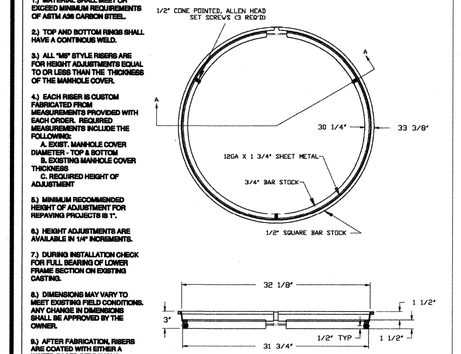


CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
ENGINEERING, CONSTRUCTION AND REAL ESTATE GROUP

STEEL ADJUSTING RISER
(NOT TO SCALE)

CITY ENGINEER — DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF. DATE: XX-XX-XX — DWG. NO. 02084-02A

NOTES:
1.) MATERIAL SHALL MEET OR EXCEED MINIMUM REQUIREMENTS OF ASTM A36 CARBON STEEL.
2.) TOP AND BOTTOM RINGS SHALL HAVE A CONTINOUS WELD.
3.) ALL "MB" STYLE RISERS ARE FOR HEIGHT ADJUSTMENTS EQUAL TO OR LESS THAN THE THICKNESS OF THE MANHOLE COVER.
4.) EACH RISER IS CUSTOM FABRICATED FROM MEASUREMENTS PROVIDED WITH EACH ORDER. REQUIRED MEASUREMENTS INCLUDE THE FOLLOWING:
A. EXIST. MANHOLE COVER DIAMETER - TOP & BOTTOM
B. EXISTING MANHOLE COVER THICKNESS
C. REQUIRED HEIGHT OF ADJUSTMENT
5.) MINIMUM RECOMMENDED HEIGHT OF ADJUSTMENT FOR REPAVING PROJECTS IS 1".
6.) HEIGHT ADJUSTMENTS ARE AVAILABLE IN 1/4" INCREMENTS.
7.) DURING INSTALLATION CHECK FOR FULL BEARING OF LOWER FRAME SECTION ON EXISTING CASTING.
8.) DIMENSIONS MAY VARY TO MEET EXISTING FIELD CONDITIONS. ANY CHANGE IN DIMENSIONS SHALL BE APPROVED BY THE OWNER.
9.) AFTER FABRICATION, RISERS ARE COATED WITH EITHER A WATER BASED BITUMINOUS ASPHALT EMULSION PAINT OR BASF E-COAT W/ CHARCOAL BLACK TOPCOAT.



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

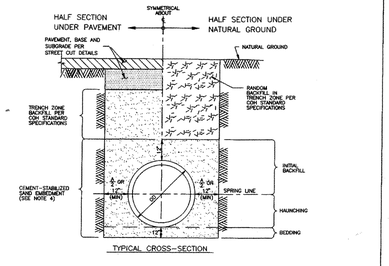
STEEL ADJUSTING RISER
(NOT TO SCALE)

CITY ENGINEER — DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF. DATE: XX-XX-XX — DWG. NO. 02084-02B

NOTES:
1. THIS DETAIL MAY BE USED ONLY FOR DRY STABLE TRENCH CONDITIONS PER CON STANDARD SPECIFICATIONS. USE CON STANDARD DETAILS FOR REQUIREMENTS IN OTHER CONDITIONS.
2. MIN TRENCH WIDTH SHALL BE PIPE OD PLUS 24 INCHES, UNLESS OTHERWISE NOTED FOR THE NOMINAL PIPE SIZE:

NOMINAL PIPE SIZE	"A"
18" TO 30"	24"
OVER 30"	30"

3. MAX TRENCH WIDTH SHALL BE NOT GREATER THAN MIN TRENCH WIDTH PLUS 24 INCHES, UNLESS OTHERWISE NOTED.
4. ALTERNATIVE EMBEDMENT BACKFILL MATERIALS FOR STABLE MAINS MAY BE ALLOWED PER CON STANDARD SPECIFICATIONS.



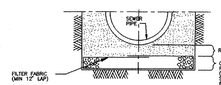
TYPICAL CROSS-SECTION

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

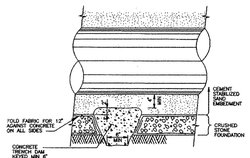
SANITARY OR STORM SEWER
BEDDING AND BACKFILL
FOR DRY STABLE TRENCH
(NOT TO SCALE)

CITY ENGINEER — DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: OCT-01-2002 — DWG NO: 02317-03

NOTES:
1. ACTUAL SHAPE OF CONCRETE TRENCH DAM SHOWN IS SCHEMATIC. CONSTRUCTION IN FIELD MEETING MINIMUM THICKNESS AND KEY DEPTH REQUIREMENTS.
2. THIS DETAIL SHALL BE USED ONLY FOR CEMENT STABILIZED SAND EMBEDMENT OR OTHER CLASS A EMBEDMENT IN WET STABLE TRENCH CONDITIONS.
3. PLACE TRENCH DAMS IN CLASS I EMBEDMENTS AT THE MIDPOINT OF EACH STANDARD LENGTH (NOT TO EXCEED 100 FEET) BETWEEN MANHOLES.



CROSS-SECTION OF CRUSHED STONE FOUNDATION



LONGITUDINAL SECTION ALONG PIPE ℄ AT FOUNDATION TRENCH DAM

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

SANITARY OR STORM SEWER
CRUSHED STONE FOUNDATION
FOR WET STABLE TRENCH
(NOT TO SCALE)

CITY ENGINEER — DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: OCT-01-2002 — DWG NO: 02317-02

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SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

STATE OF TEXAS
JOHN D. RUDLOFF
83386
LICENSED
PROFESSIONAL ENGINEER
10/19/11

Job No.: 09-051	Dwn By: F. Redburn
Date: May 2011	Chkd By: D. Jorgensen

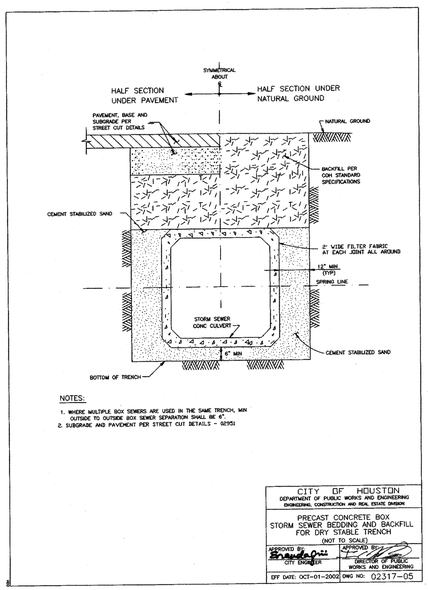
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Storm Sewer Details I

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	
DRAWING SCALE	
VERT: NA HORZ: NA	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	
SHEET No: 110 OF 122	

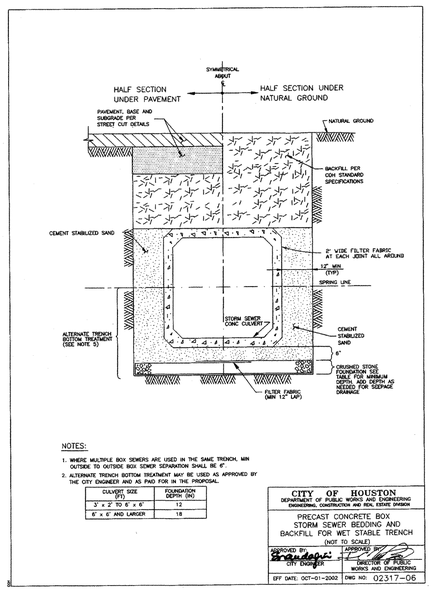
PUBLIC WORKS AND ENGINEERING
ACCEPTED AND FILED
48978
LICENSE NUMBER
STATE OF TEXAS



NOTES:

1. WHERE MULTIPLE BOX SEWERS ARE USED IN THE SAME TRENCH, MIN OUTSIDE TO OUTSIDE BOX SEWER SEPARATION SHALL BE 6".
2. SUBGRADE AND PAVEMENT PER STREET CUT DETAILS - 02951

CITY OF HOUSTON DEPARTMENT OF PUBLIC WORKS AND ENGINEERING ENGINEERING, CONSTRUCTION AND REAL ESTATE DIVISION	
PRECAST CONCRETE BOX STORM SEWER BEDDING AND BACKFILL FOR DRY STABLE TRENCH (NOT TO SCALE)	
APPROVED BY: CITY ENGINEER	APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: OCT-01-2002	DWG NO: 02317-05

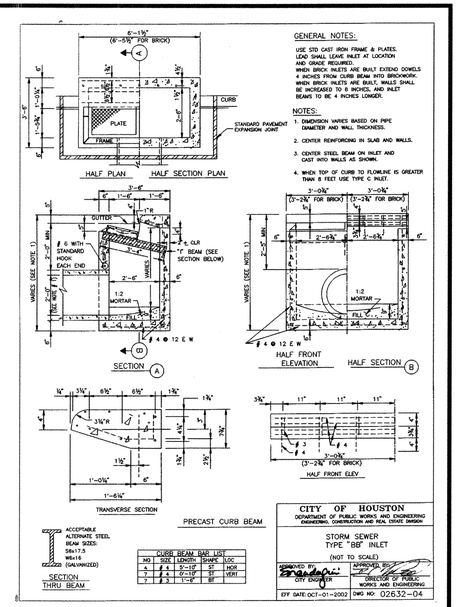


NOTES:

1. WHERE MULTIPLE BOX SEWERS ARE USED IN THE SAME TRENCH, MIN OUTSIDE TO OUTSIDE BOX SEWER SEPARATION SHALL BE 6".
2. ALTERNATE TRENCH BOTTOM TREATMENT MAY BE USED AS APPROVED BY THE CITY ENGINEER AND AS PAID FOR IN THE PROPOSAL.

CULVERT SIZE (I.D.)	FOUNDATION DEPTH (D)
3' x 2' TO 6' x 6'	12
8' x 6' AND LARGER	18

CITY OF HOUSTON DEPARTMENT OF PUBLIC WORKS AND ENGINEERING ENGINEERING, CONSTRUCTION AND REAL ESTATE DIVISION	
PRECAST CONCRETE BOX STORM SEWER BEDDING AND BACKFILL FOR WET STABLE TRENCH (NOT TO SCALE)	
APPROVED BY: CITY ENGINEER	APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: OCT-01-2002	DWG NO: 02317-06



GENERAL NOTES:

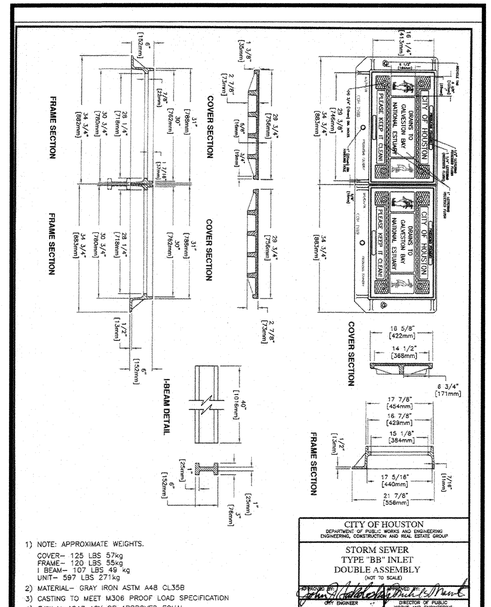
USE STD CAST IRON FRAME & PLATES. LEAD SHALL LEAVE INLET AT LOCATION AND GRADE REQUIRED.
WHEN BRICK INLETS ARE BUILT EXTEND DOWELS 4 INCHES FROM CURB BEAM INTO BRICKWORK. WHEN BRICK INLETS ARE BUILT, WALLS SHALL BE INCREASED TO 8 INCHES, AND INLET BEAMS TO BE 4 INCHES LONGER.

NOTES:

1. DIMENSION VARIES BASED ON PIPE DIAMETER AND WALL THICKNESS.
2. CENTER REINFORCING IN SLAB AND WALLS.
3. CENTER STEEL BEAM ON INLET AND CAST INTO WALLS AS SHOWN.
4. WHEN TOP OF CURB TO FLOWLINE IS GREATER THAN 8 FEET USE TYPE C INLET.

CURB BEAM BAR LIST				
NO	SIZE	LENGTH	SHAPE	LOC
6	# 4	5'-10"	ST	HOR
7	# 4	5'-10"	ST	VERT
7	# 3	1'-4"	BT	

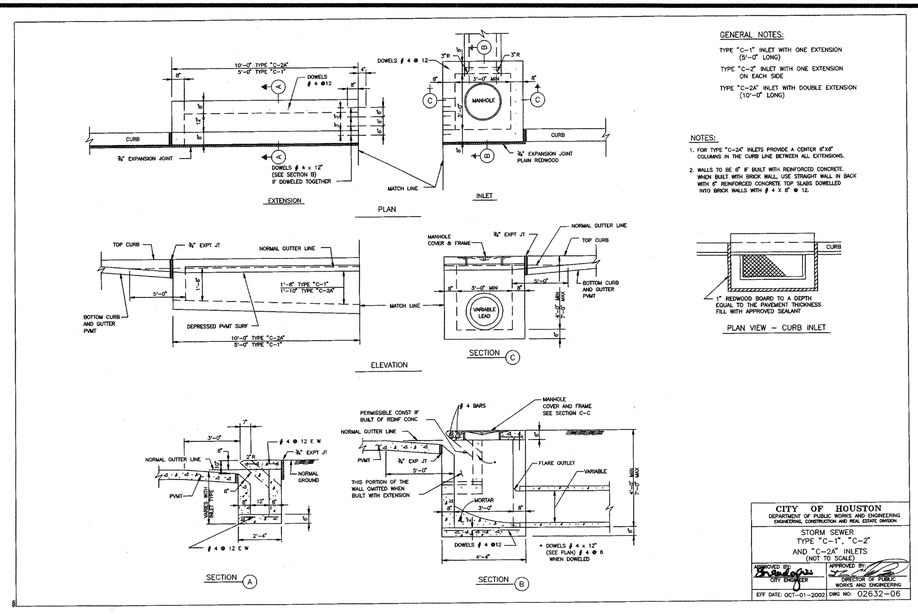
CITY OF HOUSTON DEPARTMENT OF PUBLIC WORKS AND ENGINEERING ENGINEERING, CONSTRUCTION AND REAL ESTATE DIVISION	
STORM SEWER TYPE "BB" INLET (NOT TO SCALE)	
APPROVED BY: CITY ENGINEER	APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE:OCT-01-2002	DWG NO: 02632-04



1) NOTE: APPROXIMATE WEIGHTS.
COVER= 125 LBS 57kg
FRAME= 120 LBS 55kg
I BEAM= 107 LBS 49 kg
UNIT= 597 LBS 271kg
2) MATERIAL= GRAY IRON ASTM A48 CL35B
3) CASTING TO MEET M306 PROOF LOAD SPECIFICATION
4) EJIW V-4243 ASY OR APPROVED EQUAL

CITY OF HOUSTON DEPARTMENT OF PUBLIC WORKS AND ENGINEERING ENGINEERING, CONSTRUCTION AND REAL ESTATE GROUP	
STORM SEWER TYPE "BB" INLET DOUBLE ASSEMBLY (NOT TO SCALE)	
APPROVED BY: CITY ENGINEER	APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF. DATE: 04-01-07	DWG. NO. 02594-04

Note:
SEE ALSO GUTTER DEPRESSIONS FOR TYPE "BB" INLET DETAIL ON SHEET 114.



GENERAL NOTES:

TYPE "C-1" INLET WITH ONE EXTENSION (5'-0" LONG)

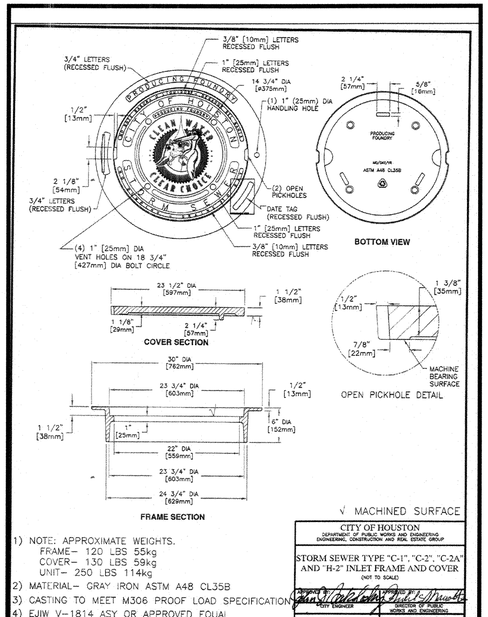
TYPE "C-2" INLET WITH ONE EXTENSION ON EACH SIDE

TYPE "C-2A" INLET WITH DOUBLE EXTENSION (10'-0" LONG)

NOTES:

1. FOR TYPE "C-2A" INLETS PROVIDE A CENTER 6"x6" COLUMN IN THE CURB LINE BETWEEN ALL EXTENSIONS.
2. WALLS TO BE 8" IF BUILT WITH REINFORCED CONCRETE. WHEN BUILT WITH BRICK WALL, USE STRAIGHT WALL IN BACK WITH 6" REINFORCED CONCRETE TOP SLABS DOWELED INTO BRICK WALLS WITH # 4 X 8" @ 12.

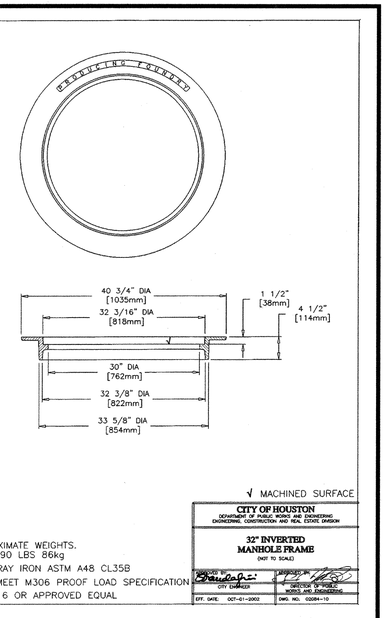
CITY OF HOUSTON DEPARTMENT OF PUBLIC WORKS AND ENGINEERING ENGINEERING, CONSTRUCTION AND REAL ESTATE DIVISION	
STORM SEWER TYPE "C-1", "C-2" AND "C-2A" INLETS (NOT TO SCALE)	
APPROVED BY: CITY ENGINEER	APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: OCT-01-2002	DWG NO: 02632-06



√ MACHINED SURFACE

1) NOTE: APPROXIMATE WEIGHTS.
FRAME= 120 LBS 55kg
COVER= 130 LBS 59kg
UNIT= 250 LBS 114kg
2) MATERIAL= GRAY IRON ASTM A48 CL35B
3) CASTING TO MEET M306 PROOF LOAD SPECIFICATION
4) EJIW V-1814 ASY OR APPROVED EQUAL

CITY OF HOUSTON DEPARTMENT OF PUBLIC WORKS AND ENGINEERING ENGINEERING, CONSTRUCTION AND REAL ESTATE GROUP	
STORM SEWER TYPE "C-1", "C-2", "C-2A" AND "H-2" INLET FRAME AND COVER (NOT TO SCALE)	
APPROVED BY: CITY ENGINEER	APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF. DATE: 04-01-07	DWG. NO. 02594-08



√ MACHINED SURFACE

1) NOTE: APPROXIMATE WEIGHTS.
FRAME = 190 LBS 86kg
2) MATERIAL= GRAY IRON ASTM A48 CL35B
3) CASTING TO MEET M306 PROOF LOAD SPECIFICATION
4) MODEL V-1816 OR APPROVED EQUAL

CITY OF HOUSTON DEPARTMENT OF PUBLIC WORKS AND ENGINEERING ENGINEERING, CONSTRUCTION AND REAL ESTATE DIVISION	
32" INVERTED MANHOLE FRAME (NOT TO SCALE)	
APPROVED BY: CITY ENGINEER	APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF. DATE: OCT-01-2002	DWG. NO. 02694-10

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Houston, Texas 77027

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SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

STATE OF TEXAS
JOHN D. RUDLOFF
83386
LICENSED
PROFESSIONAL ENGINEER
10/9/11

Job No.: 09-051	Dwn By: F. Redburn
Date: May 2011	Chkd By: D. Jorgensen

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

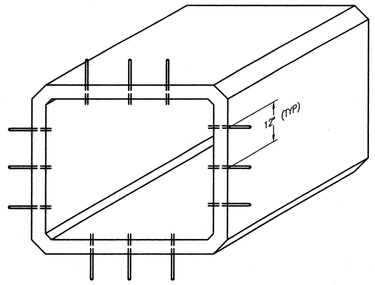
City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Storm Sewer Details II

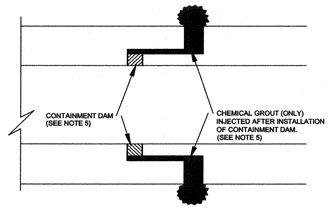
WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	
DRAWING SCALE	
VERT: NA HORZ: NA	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	

PUBLIC WORKS AND ENGINEERING
PLANS FILED
48978
LICENSE NUMBER
EXAS

SHEET No: 111 OF 122



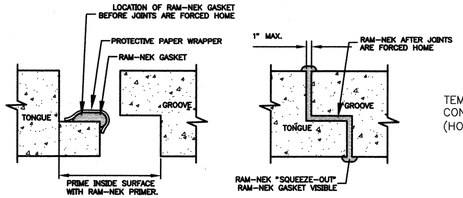
JOINT REPAIR SPACING



JOINT REPAIR DETAIL

NOTES:

1. JOINT REPAIR SHALL BE PERFORMED FROM THE INSIDE OF THE STORM SEWER SYSTEM AND SHALL BE PERFORMED IN STRICT ACCORDANCE TO ALL LOCAL, STATE, AND FEDERAL LAWS. THE CONTRACTOR SHALL PROVIDE A SAFETY PLAN THAT SHALL INCLUDE BUT NOT LIMITED TO, GAS DETECTOR, TRIPOD AND WRENCH, HARNESS, VENTILATION DEVICES, ETC.
2. CONTRACTOR SHALL REMOVE ALL EXISTING FILL AND DEBRIS FROM ALL AREAS AROUND THE JOINTS TO A WIDTH OF 12" FROM CENTERLINE OF JOINT. THE FILL AND DEBRIS CAN BE TEMPORARILY PLACED ADJACENT TO THE JOINT AND BE REPLACED IN THE SAME LOCATION AT THE SAME HEIGHT AFTER REPAIR OF JOINT. FILL WILL NOT BE ALLOWED TO REMAIN IN A PILE AFTER REPAIR OF THE JOINT.
3. COFFERDAMS, SANDBAGS, PUMPS AND OTHER MEANS OF DEWATERING SHALL BE USED TO MAINTAIN THE WATER AT A LOW LEVEL. IT IS NOT NECESSARY FOR THE JOINT TO BE DRY, BUT WATER LEVEL SHALL BE MAINTAINED AT AS LOW A LEVEL AS IS PRACTICAL. FLOW IN BOX CULVERTS MUST BE CONTROLLED TO AN EXTENT THAT JOINT BEGINNING REPAIRED IS NOT INUNDATED BY WATER.
4. ALL EXISTING BITUMINOUS JOINT SEALANT MATERIAL, SHALL BE REMOVED FROM JOINTS PRIOR TO WORK. THE JOINTS SHALL BE CLEANED BY PRESSURIZED WATER BLASTERS TO TO REMOVE LOOSE DEBRIS.
5. THE JOINTS SHALL HAVE A "CONTAINMENT DAM" USED TO PROVIDE CONTAINMENT FOR THE GROUT THAT IS INJECTED BEHIND THE BOX CULVERT. THE "CONTAINMENT DAM" SHALL BE AN APPROVED CEMENTITIOUS GROUT OR SATURATED JUTE OAKUM WITH AN APPROVED CHEMICAL GROUT, AS INDICATED IN SPECIFICATIONS. CEMENTITIOUS GROUT MAY ONLY BE USED IN SECTIONS OF NON-SUBMERGED JOINTS ONLY. SATURATED JUTE OAKUM SHALL BE USED IN SUBMERGED AREAS AND MAY BE USED IN NON-SUBMERGED AREAS AS WELL. NON-SUBMERGED AREAS ARE DEFINED AS SECTIONS IN THE JOINT THAT ARE A MINIMUM OF ONE (1) FOOT ABOVE THE STANDING WATER LEVEL OF THE BOX CULVERT, AT EITHER PRE-CONSTRUCTION OR CONSTRUCTION PHASE, WHICHEVER IS HIGHER. ALL OTHER AREAS OF THE JOINT ARE CONSIDERED SUBMERGED.
6. AFTER THE INSTALLATION OF THE CONTAINMENT DAM, CHEMICAL GROUT SHALL BE PUMPED BEHIND CULVERT @ 12" SPACING STARTING AT THE MIDDLE OF THE BOTTOM JOINT UNTIL OUTCROPPING IS SEEN OR GROUT ACHIEVES A PRESSURE OF 125 PSI OR AS PER MANUFACTURERS SUGGESTED PRESSURE CRITERIA.
7. OUTCROPPED CHEMICAL GROUT MATERIAL SHALL BE REMOVED, FLUSHED TO JOINT, AND DISPOSED OF PROPERLY.
8. CLEANUP MUST BE DONE WITHOUT INORDINATE USE OF FLAMMABLE OR HAZARDOUS CHEMICALS.
9. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING ANY IMPEDANCE TO FLOW, SUCH AS TEMPORARY COFFERDAMS, SANDBAGS, AND EQUIPMENT FROM THE BOX CULVERTS IN THE EVENT OF RAIN.



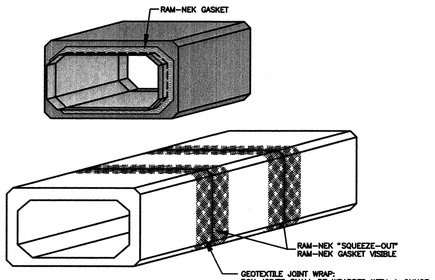
HORIZONTAL APPLICATION

RAM-NEK GASKET INSTALLATION DETAIL

NOT TO SCALE

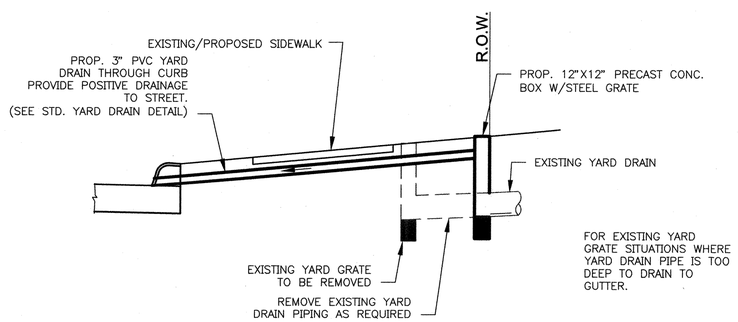
HORIZONTAL NOTES:

1. TRENCH CONDITIONS SHALL BE SUCH THAT PIPE JOINTING CAN BE ACCOMPLISHED WITHOUT GETTING MUD, SILT, GRAVEL OR OTHER FOREIGN MATERIALS INTO THE JOINT. GENERALLY THE TRENCH SHOULD BE DEWATERED AND HAVE A FIRM BOTTOM FREE OF MUCK.
2. PRIME JOINT AS PER MANUFACTURER'S RECOMMENDATIONS. REMOVE PROTECTIVE WRAPPER ON ONE SIDE OF PREFORMED RAM-NEK STRIP OR COIL AND PRESS FIRMLY TO DRY, CLEAN JOINT SURFACE. BEFORE LAYING THE PIPE IN THE TRENCH, ATTACH THE GASKETS END-TO-END TO THE LEADING EDGE OF THE TONGUE OR GROOVE OF EACH PIPE JOINT, FORMING A CONTINUOUS GASKET AROUND THE CIRCUMFERENCE. REMOVE PROTECTIVE WRAPPER BEFORE JOINING PIPE SECTIONS.
3. AFTER THE GASKET IS APPLIED, THE PIPE SHOULD BE HANDLED CAREFULLY TO AVOID DISPLACING OR SOILING OF GASKET. ANY GASKET SO DISTURBED SHOULD BE REPLACED.
4. THE PIPE SHOULD BE PROPERLY ALIGNED BEFORE JOINTS ARE FORCED HOME. FOR TONGUE AND GROOVE PIPE, THE PIPE SHOULD BE PARTIALLY SUPPORTED TO MAINTAIN CONCENTRICITY UNTIL THE GASKET IS PROPERLY COMPRESSED IN THE JOINT SPACE AND SUFFICIENT PRESSURE APPLIED TO MAKE SURE THAT THE JOINT IS PROPERLY MADE.
5. LIFT HOLE PLUG SHALL BE GROUTED IN PLACE PRIOR TO BACKFILLING.
6. BACKFILLING AND COMPACTION CAN BEGIN WHEN JOINTING & GROUTING ARE COMPLETED.
7. CONTRACTOR SHALL FOLLOW APPLICATION INSTRUCTIONS PROVIDED BY THE MANUFACTURER. THE GAP BETWEEN THE FACE OF THE TONGUE AND GROOVE SHALL NOT EXCEED 1" AFTER JOINTS ARE FORCED HOME. IF JOINT GAP EXCEEDS 1" THEN JOINT SHALL BE REPAIRED AS PER JOINT REPAIR DETAIL AND SPECIFICATION. THIS IS NOT CONSIDERED A 1" AVERAGE. JOINT REPAIR SHALL BE PERFORMED ON SECTIONS OF THE JOINT THAT EXCED 1". IF MORE THAN HALF THE JOINT EXCEEDS 1", THEN THE WHOLE JOINT SHALL BE REPAIRED (NO SEPARATE PAY SHALL BE MADE FOR JOINT REPAIR).

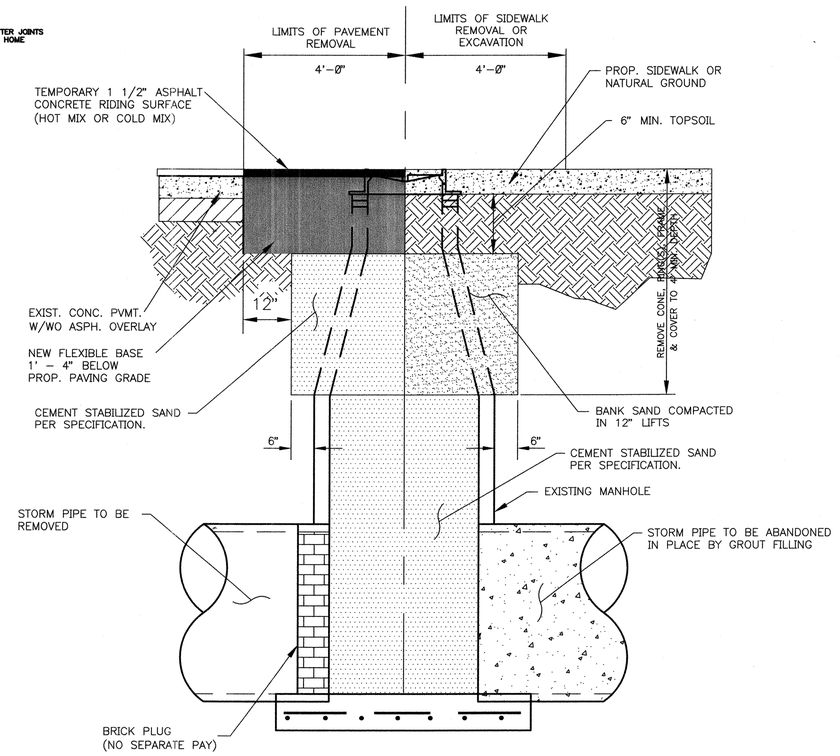


RAM-NEK DETAIL

NOT TO SCALE

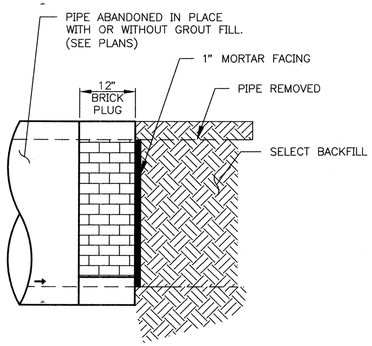


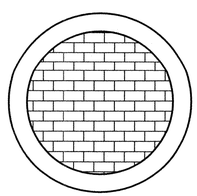
YARD DRAIN CONNECTION W/ YARD GRATE



DEMOLITION/ABANDONMENT OF STORM SEWER MANHOLE

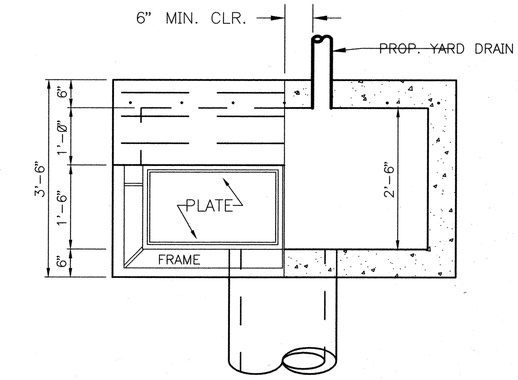
NOT TO SCALE



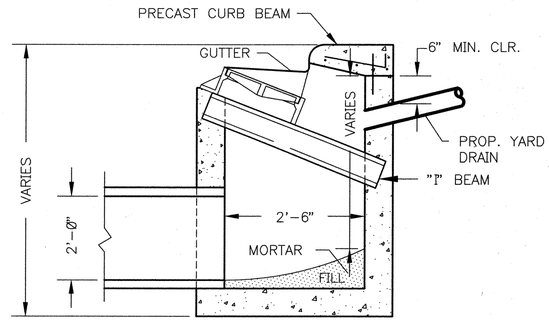


STORM SEWER PLUG

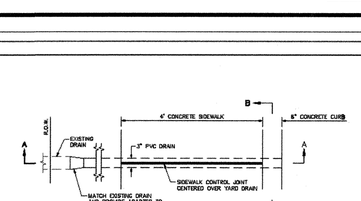
NOT TO SCALE



HALF PLAN - HALF HORIZ. SECTION



YARD DRAIN CONNECTION AT BACK OF INLET



PVC YARD DRAIN DETAIL

N.T.S.

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
PVC YARD DRAIN DETAIL
(NOT TO SCALE)
APPROVED BY: CITY ENGINEER
APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: NOV-01-2005 STD NO. 02631-01

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STATE OF TEXAS — JOHN D. RUDLOFF — 83386 — LICENSED — PROFESSIONAL ENGINEER — 10/11/11

SURVEYED BY: Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 | Dwn By: F. Redburn
Date: May 2011 | Chkd By: D. Jorgensen

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Storm Sewer Details III

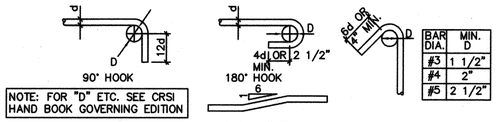
WBS NO. N-000378-0002-4

DRAWING SCALE
VERT: NA HORZ: NA
CITY OF HOUSTON PM
MARK BOARD, P.E.

FOR CITY OF HOUSTON USE ONLY

PUBLIC WORKS AND ENGINEERING — APPROVED AND FILED — 48978 — NUMBER

SHEET No: 112 OF 122



BAR DIA.	MIN. D
#3	1 1/2"
#4	2"
#5	2 1/2"

NOTE: FOR "D" ETC. SEE CRSI HAND BOOK GOVERNING EDITION

PRINCIPAL REINFORCING — TIE OR STIRRUP

NOTES:
1. ALL BENDS SHALL BE MADE COLD.
2. #14 AND #18 BARS SHALL BE BEND-TESTED AND APPROVED PRIOR TO BENDING.

1 Bar Bending Details
SCALE: N.T.S.

CONCRETE:

MATERIAL:
1. CONCRETE SHALL BE NORMAL WEIGHT CONCRETE WITH MINIMUM f'c AS INDICATED BELOW.

   A. PIERS, FOOTINGS ..... f'c=3000 PSI AT 28 DAYS.

2. REINFORCING STEEL SHALL CONFORM TO FOLLOWING GRADE.
   REINFORCING BARS ASTM A-615 GRADE 60 EXCEPT NOTED
   WELDED WIRE FABRIC ASTM A-185
   REINFORCING BARS WELDED TO STEEL SHALL BE WELDABLE GRADE 40
3. DETAILING OF REINFORCING BARS AND ACCESSORIES SHALL BE IN ACCORDANCE WITH ACI PUBLICATION 315, LATEST EDITION.
4. ALL MIXING TRANSPORTING, PLACING, CURING OF CONCRETE SHALL BE ACCORDANCE WITH RECOMMENDATION OF AMERICAN CONCRETE INSTITUTE.
5. ALL MIX DESIGN SHALL BE SUBJECT TO ENGINEER'S APPROVAL.
6. ALL REINFORCING BARS SHALL HAVE CLASS B LAP SPLICE PER ACI-318-02 SECTION 12.15 UNO ON DRAWINGS.
7. ALL REINFORCING SHALL BE SUPPORTED IN PLACE BY STANDARD CHAIRS. PROVIDE 3"x6"x 20 GAGE SHEET METAL BAR CHAIR AT 4'-0" O.C. EACH WAY FOR ALL TOP REINFORCING FOR SLAB ON GRADE.
8. ALL CONSTRUCTION JOINTS SHALL BE SUBJECT TO ENGINEERS APPROVAL.
9. FORMS SHALL NOT BE REMOVED UNTIL FOLLOWING STRENGTH IS REACHED. THE STRENGTH SHOWN BELOW IS THE PERCENTAGE OF 28 DAY COMPRESSIVE STRENGTH f'c.

   WALL, COLUMN, BEAM SIDE 40 PERCENT

10. ALL POURED IN PLACE CONCRETE MEMBERS SHALL HAVE FOLLOWING CLEAR COVER TO REINFORCING.

FOOTING AND PIERS	3 INCH
GRADE BEAMS BOTTOM	3 INCH
SIDE POURED AGAINST SOIL	3 INCH
SIDE FORMED	2 INCH
TOP	1 1/2 INCH WALLS
SIDE EXPOSED TO EARTH	2 INCH
ALL OTHER	3/4 INCH
SLAB ON GRADE	1 INCH(TOP)

11. PROVIDE GRANULAR FILL BEHIND WALLS AS REQUIRED BY WEEP HOLE DETAILS ON SHEET 115.

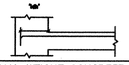
LAP & DEVELOPMENT LENGTH INCH
NORMAL WEIGHT CONCRETE-REFER NOTES BELOW

BAR SIZE	LAP CLASS	f'c=3000 psi TOP	f'c=3000 psi OTHER	f'c=4000 psi TOP	f'c=4000 psi OTHER	f'c=5000 psi TOP	f'c=5000 psi OTHER
#3	A	22	17	19	15	17	13
	B	28	22	24	19	22	17
#4	A	29	22	25	19	22	17
	B	37	29	32	25	29	22
#5	A	36	28	31	24	28	22
	B	47	36	40	31	36	28
#6	A	43	33	37	29	33	26
	B	56	43	48	37	43	33
#7	A	63	48	54	42	49	37
	B	81	63	70	54	63	49
#8	A	72	55	62	48	55	43
	B	93	72	80	62	72	55
#9	A	81	62	70	54	63	48
	B	105	81	91	70	81	63
#10	A	91	70	79	61	70	54
	B	118	91	102	79	91	70
#11	A	101	78	87	67	78	60
	B	131	101	113	87	101	78

1. DEVELOPMENT LENGTH 'ld' OF A BARS IS EQUAL TO LENGTH OF CLASS A LAP LENGTH.

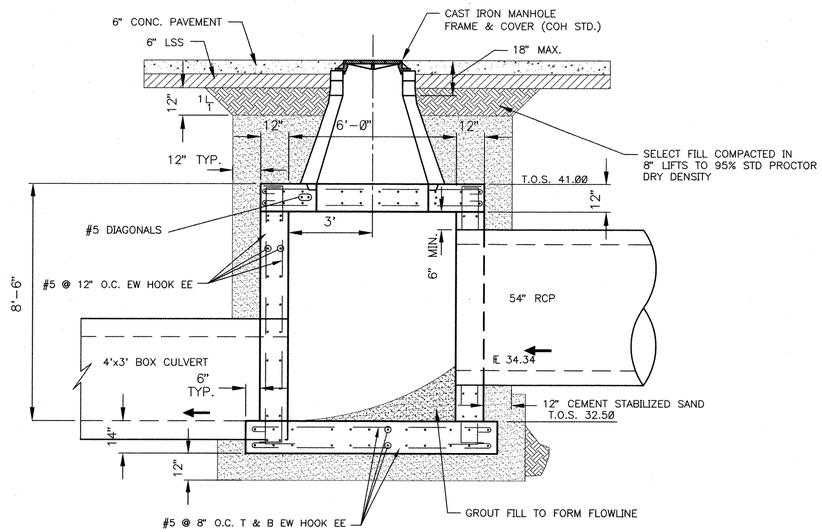
2 Reinforcing Development And Lap Lengths
SCALE: N.T.S.

MINIMUM TENSION EMBEDMENT LENGTHS 'ldh' FOR STANDARD HOOKS - GRADE 60(FY-60,000PSI) REINFORCING BARS

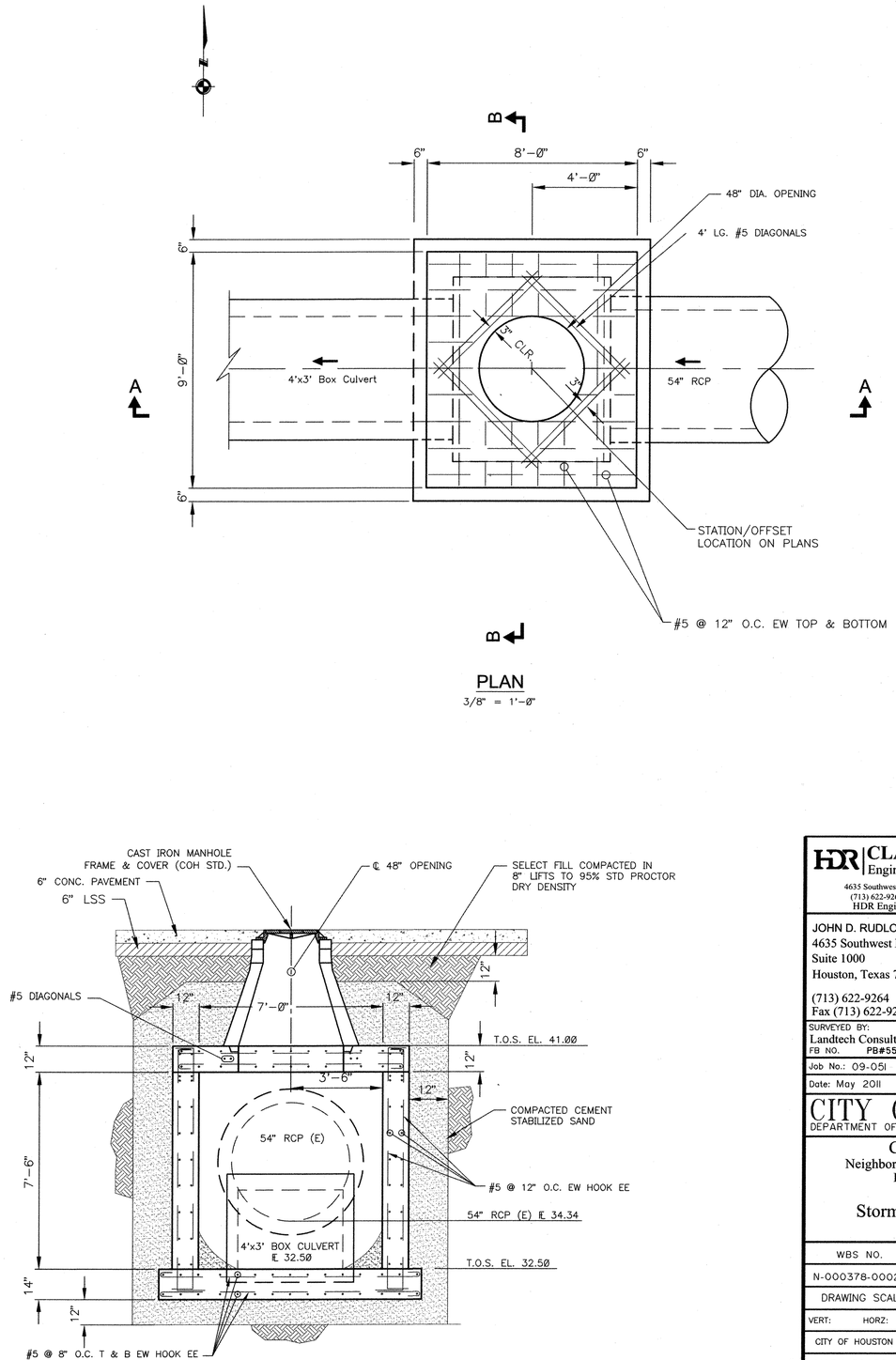


BAR SIZE	NORMAL WEIGHT CONCRETE f'c=3000 psi	f'c=4000 psi	f'c=5000 psi
#3	6	6	6
#4	8	7	6
#5	10	9	8
#6	12	10	9
#7	14	12	11
#8	16	14	12
#9	18	15	14
#10	20	17	15
#11	22	19	17

3 Reinforcing 'ldh' Lengths
SCALE: N.T.S.



SECTION A-A
3/8" = 1'-0"



PLAN
3/8" = 1'-0"

SECTION B-B
3/8" = 1'-0"

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SURVEYED BY:
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STATE OF TEXAS — JOHN D. RUDLOFF — 83386 — LICENSED PROFESSIONAL ENGINEER
10/19/11

Job No.: 09-051	Dwn By: G.S.F.
Date: May 2011	Chkd By: D. Jorgensen

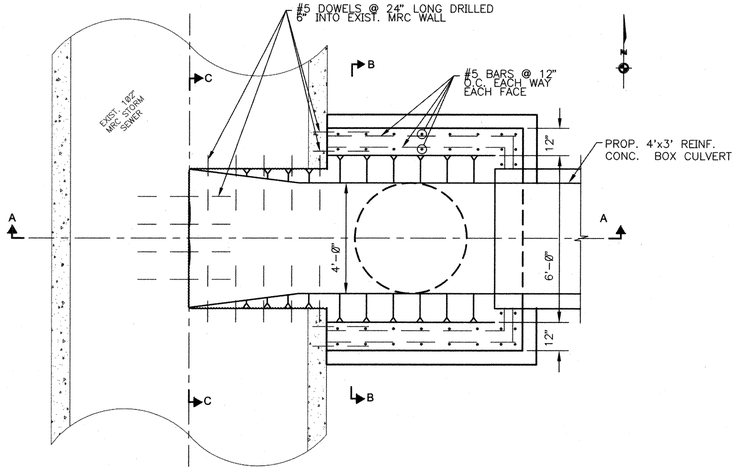
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

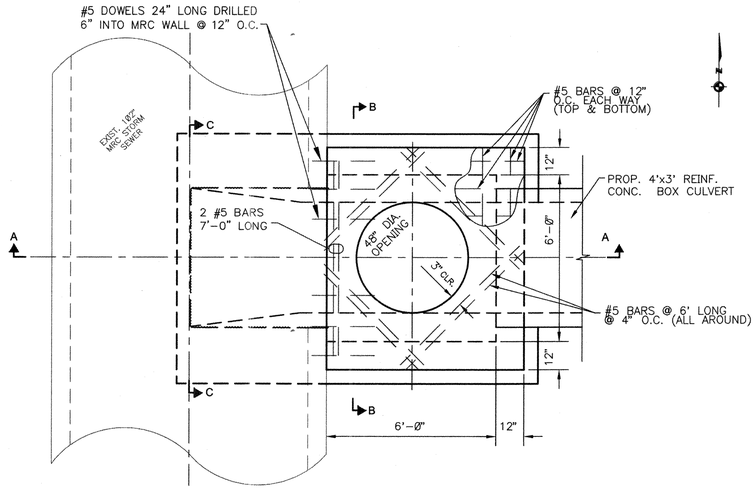
Storm Sewer Details IV

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	PUBLIC WORKS AND ENGINEERING — APPROVED AND FILED — 48978 — NUMBER — EXAMINED
DRAWING SCALE	
VERT: HORZ:	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	
SHEET No: 113 OF 122	

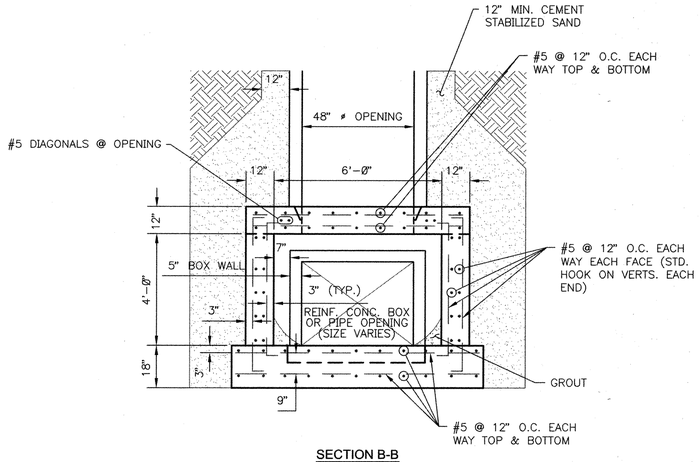
AB



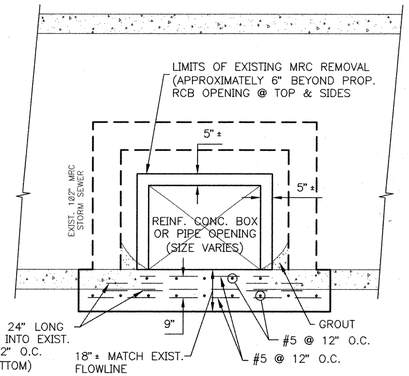
BOTTOM PLAN



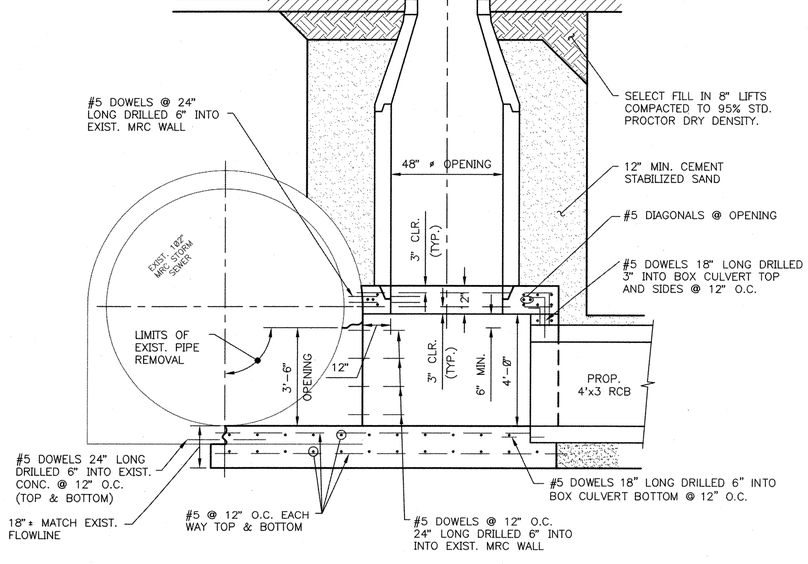
TOP PLAN



SECTION B-B



SECTION C-C



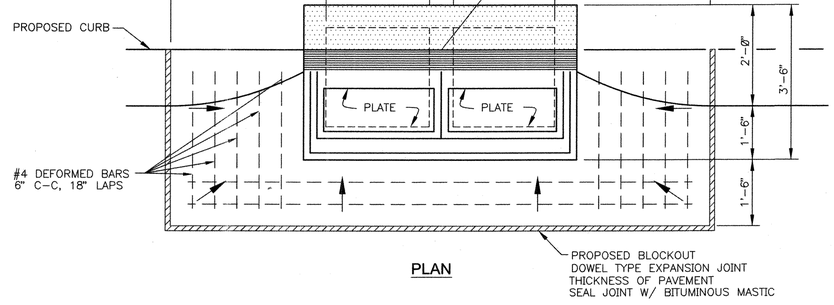
SECTION A-A

1.) ALL CONCRETE SHALL HAVE SAND AND GRAVEL AGGREGATE TYPE I PORTLAND CEMENT WITH 28 DAY COMPRESSIVE STRENGTH ($f'c$) OF 3000 PSI.

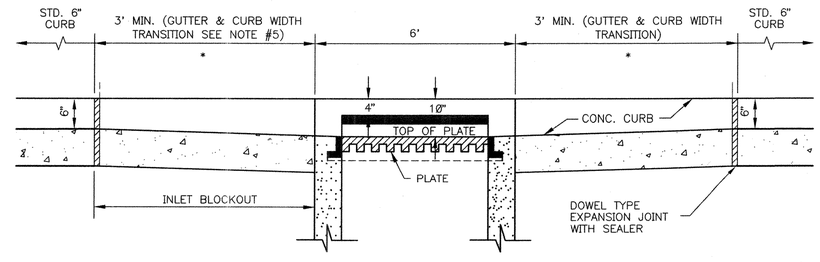
2.) ALL REINFORCING BARS SHALL CONFORM TO ASTM A615–GRADE 60.

STORM SEWER JUNCTION BOX

SCALE: 3/8" = 1'–0"



PLAN



ELEVATION

* CERTAIN INLETS ARE NOT LOCATED EXACTLY AT VPI'S. GUTTER TRANSITIONS ARE CRITICAL. CONTRACTOR SHALL TAKE PARTICULAR CARE TO CONSTRUCT GUTTER TRANSITIONS.

GUTTER DEPRESSIONS FOR TYPE "BB" INLET

NOT TO SCALE

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STATE OF TEXAS · JOHN D. RUDLOFF · 83386 · LICENSED PROFESSIONAL ENGINEER · 10/19/11

SURVEYED BY: Landtech Consultants, Inc. FB NO. PB#5543

Job No.: 09-051 | Dwn By: F. Redburn

Date: May 2011 | Chkd By: D. Jorgensen

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

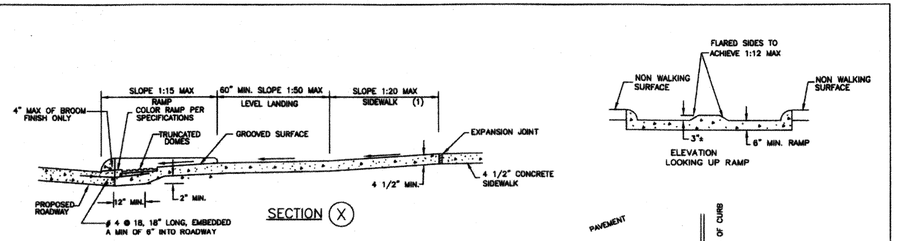
City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Storm Sewer Details V

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	
DRAWING SCALE	
VERT: HORZ:	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	
SHEET No: 114 OF 122	

REVIEWED AND FILED · PUBLIC WORKS AND ENGINEERING · 48978 · NUMBER · TEXAS

MB



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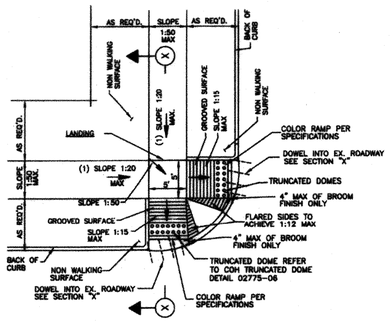
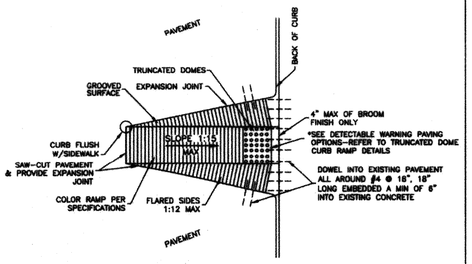


STREETS WITH NON-WALKING SURFACE BEHIND CURB

N.T.S.



RAMP CONSTRUCTION FOR EXISTING PAVEMENT

NOTES:

1. REPLACE EXISTING SIDEWALK FROM LEVEL LANDING AS NECESSARY TO ACHIEVE 1:20 SLOPE
2. SLOPES GREATER THAN 1:20 BUT LESS THAN 1:15 (MAX) REQUIRE GROOVES AND COLORING

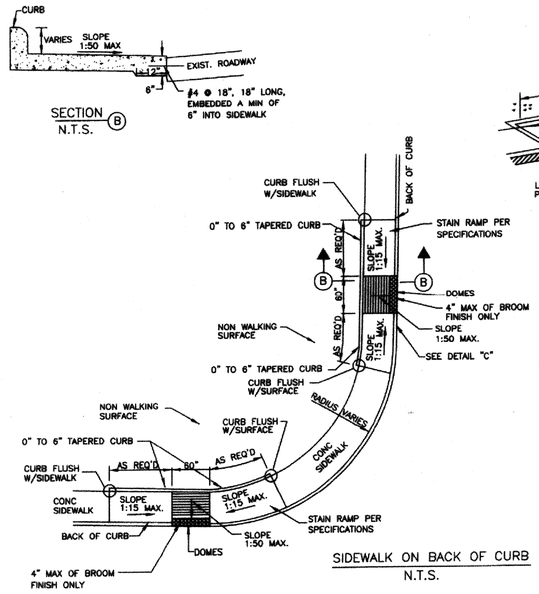
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WHEEL CHAIR RAMP DETAILS

(NOT TO SCALE)

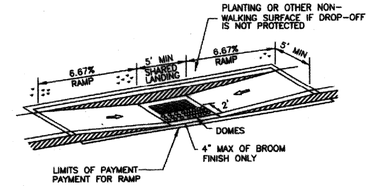
APPROVED BY: CITY ENGINEER
APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING

EFF DATE: APR-18-2011 | DWG NO: 02775-02



SIDEWALK ON BACK OF CURB

N.T.S.



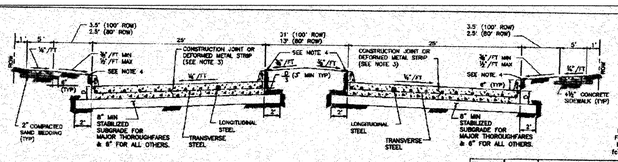
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

PARALLEL CURB RAMP

(NOT TO SCALE)

APPROVED BY: CITY ENGINEER
APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING

EFF DATE: APR-18-2011 | DWG NO: 02775-03



TYPICAL DOUBLE ROADWAY SECTION FOR CONCRETE PAVEMENT WITH CURBS

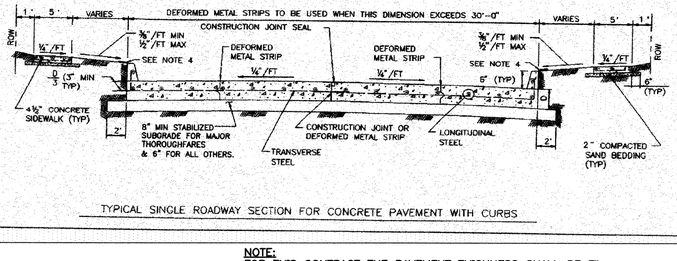
NOTES:

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-FEET SIDEWALK, ENGINEER SHALL OBTAIN A VARIANCE FROM THE CITY ENGINEER FOR A 4-FEET WIDE SIDEWALK.

TABLE 1
REINFORCING STEEL BAR SIZES AND SPACINGS FOR VARIOUS PAVEMENT THICKNESSES (D) WITH: MAXIMUM EXPANSION JOINT SPACING = 80 FT.
f_c' = 3,500 PSI/28 DAYS AND FY = 60,000 PSI

PAVEMENT THICKNESS (D) (in)	PAVEMENT WIDTH (W) (ft)	Longitudinal Steel: # 4 BARS			# 5 BARS			# 6 BARS			Transverse Steel: # 4 BARS	# 5 BARS	# 6 BARS
		NUMBER OF BARS	SPACING (IN)	END BAR SPACING (IN)	NUMBER OF BARS	SPACING (IN)	END BAR SPACING (IN)	NUMBER OF BARS	SPACING (IN)	END BAR SPACING (IN)	SPACING (IN)	SPACING (IN)	SPACING (IN)
6	28	17	20.00	4	--	--	--	--	--	--	36	--	--
7	25	17	18.25	4	--	--	--	--	--	--	36	--	--
7	30	21	18.00	4	--	--	--	--	--	--	36	--	--
7	35	25	17.75	4	--	--	--	--	--	--	36	--	--
7	37	26	18.25	4	--	--	--	--	--	--	36	--	--
7	41	28	18.00	4	--	--	--	--	--	--	36	--	--
7	45	31	17.75	3.75	--	--	--	--	--	--	36	--	--
8	35	25	15.50	3.75	13	24.50	--	--	--	--	36	36	--
8	34	27	13.50	3.5	17	20.50	4	--	--	--	36	36	--
8	43	32	13.50	3	18	20.50	4	--	--	--	36	36	--
8	44	36	13.25	4.25	18	20.50	3	--	--	--	30	36	--
8	46	34	13.75	3	19	20.75	3	--	--	--	30	36	--
8	49	38	13.75	3.25	19	20.75	3	--	--	--	30	36	--
8	53	37	13.50	3	19	20.50	4	--	--	--	30	36	--
8	53	41	13.75	3.75	21	20.75	3.5	--	--	--	30	36	--
8	56	38	13.75	3	21	20.75	3.5	--	--	--	30	36	--
8	44	36	13.25	3.75	21	20.75	3.5	--	--	--	30	36	--
8	60	39	14.00	3	21	21.00	3.5	--	--	--	30	36	--
10	23	24	13.75	3.5	17	23.25	4.5	--	--	--	24	36	--
10	34	33	12.88	4	17	19.00	4	--	--	--	36	36	36
10	38	36	12.88	3.75	21	18.75	4	--	--	--	30	36	36
10	38	36	12.50	3.5	24	18.50	4	--	--	--	30	36	36
10	44	45	12.00	4	28	18.00	4.5	--	--	--	24	36	36
10	46	46	12.00	3.5	28	18.00	3	--	--	--	24	36	36
11	35	27	11.25	3	17	16.25	4	13	24.25	3	36	36	36
11	34	34	11.00	2.75	24	17.00	2.5	17	24.00	4	24	36	36
11	38	37	11.00	3	24	19.00	3	17	25.75	4	24	36	36
11	39	40	11.00	4	24	17.25	4	17	24.00	4	24	36	36
11	44	48	11.00	3.5	30	19.00	3	21	26.00	4	24	36	36
11	46	49	11.188	3	31	17.75	3	22	25.50	4	24	36	36
12	25	--	--	--	18	14.25	4	13	24.00	3	36	36	36
12	34	--	--	--	25	14.00	4	18	23.50	3	24	36	36
12	38	--	--	--	29	14.50	4	19	23.00	3	24	36	36
12	43	--	--	--	27	13.25	3.5	20	22.25	3.5	24	36	36
12	46	--	--	--	33	13.25	4	24	23.50	4	24	36	36
12	48	--	--	--	35	13.75	3	25	23.25	4	24	36	36

MINIMUM LAP LENGTHS (L):
4 BARS, L = 22 INCHES
5 BARS, L = 27 INCHES
6 BARS, L = 32 INCHES



TYPICAL SINGLE ROADWAY SECTION FOR CONCRETE PAVEMENT WITH CURBS

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

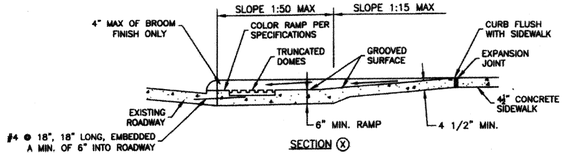
CONCRETE PAVEMENT DETAILS

(NOT TO SCALE)

APPROVED BY: CITY ENGINEER
APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING

EFF DATE: JULY-01-2009 | DWG NO: 02751-01

NOTE:
FOR THIS CONTRACT THE PAVEMENT THICKNESS SHALL BE 7" WITH THE STABILIZED BASE THICKNESS A MINIMUM OF 8".



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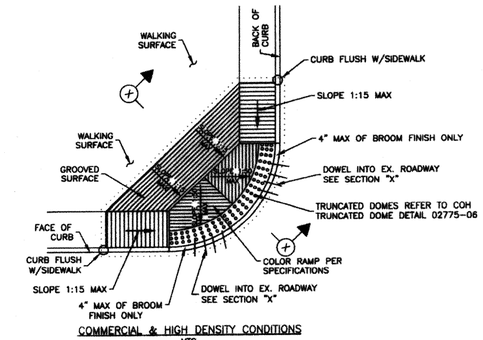

COMMERCIAL & HIGH DENSITY CONDITIONS

NTS

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

COMMERCIAL CURB RAMP DETAIL

(NOT TO SCALE)

APPROVED BY: CITY ENGINEER
APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING

EFF DATE: APR-18-2011 | DWG NO: 02775-05

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Houston, Texas 77027
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STATE OF TEXAS — JOHN D. RUDLOFF — 83386 — LICENSED PROFESSIONAL ENGINEER
10/9/11

SURVEYED BY: Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 | Dwn By: F. Redburn
Date: May 2011 | Chkd By: D. Jorgensen

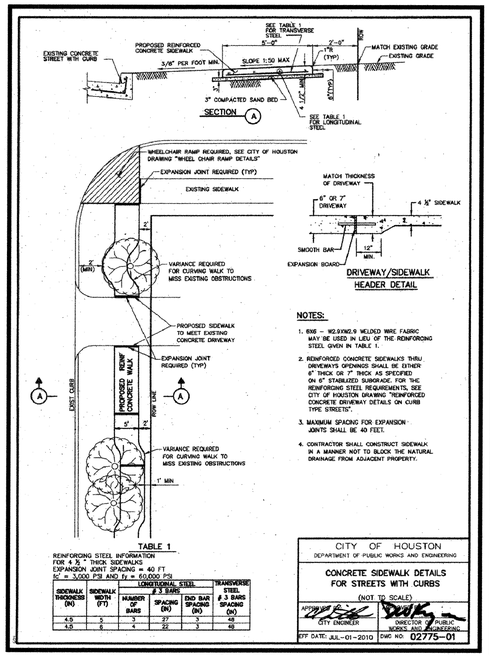
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Pavement Details I

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	PUBLIC WORKS AND ENGINEERING — ARTIFILED — 48978 — NUMBER
DRAWING SCALE	
VERT: NA HORZ: NA	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	

SHEET No: 115 OF 122



NOTES:

1. 6X6 – W2.9/W2.9 WELDED WIRE FABRIC MAY BE USED IN LIEU OF THE REINFORCING STEEL GIVEN IN TABLE 1.
2. REINFORCED CONCRETE SIDEWALKS THRU DRIVEWAYS OPENINGS SHALL BE EITHER 6" THICK OR 7" THICK AS SPECIFIED ON 6" STABILIZED SUBGRADE. FOR THE REINFORCING STEEL REQUIREMENTS, SEE CITY OF HOUSTON DRAWING "REINFORCED CONCRETE DRIVEWAY DETAILS ON CURB TYPE STREETS".
3. MAXIMUM SPACING FOR EXPANSION JOINTS SHALL BE 40 FEET.
4. CONTRACTOR SHALL CONSTRUCT SIDEWALK IN A MANNER NOT TO BLOCK THE NATURAL DRAINAGE FROM ADJACENT PROPERTY.

TABLE 1

REINFORCING STEEL INFORMATION
FOR 4 ½ " THICK SIDEWALKS
EXPANSION JOINT SPACING = 40 FT
f'c' = 3,000 PSI AND fy = 60,000 PSI

SIDEWALK THICKNESS (IN)	SIDEWALK WIDTH (FT)	LONGITUDINAL STEEL # 3 BARS: NUMBER OF BARS	LONGITUDINAL STEEL # 3 BARS: SPACING (IN)	LONGITUDINAL STEEL # 3 BARS: END BAR SPACING (IN)	TRANSVERSE STEEL # 3 BARS SPACING (IN)
4.5	5	3	27	3	48
4.5	6	4	22	3	48

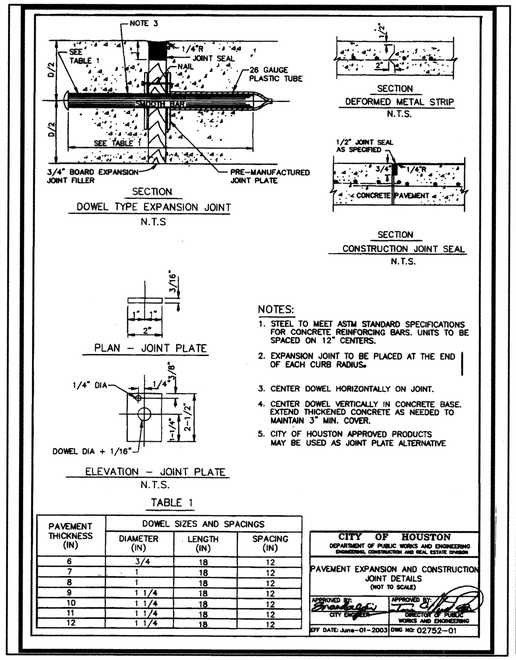
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

CONCRETE SIDEWALK DETAILS FOR STREETS WITH CURBS

(NOT TO SCALE)

APPROVED BY: CITY ENGINEER — APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING

EFF DATE: JUL-01-2010 | DWG NO. 02775-01



NOTES:

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

TABLE 1

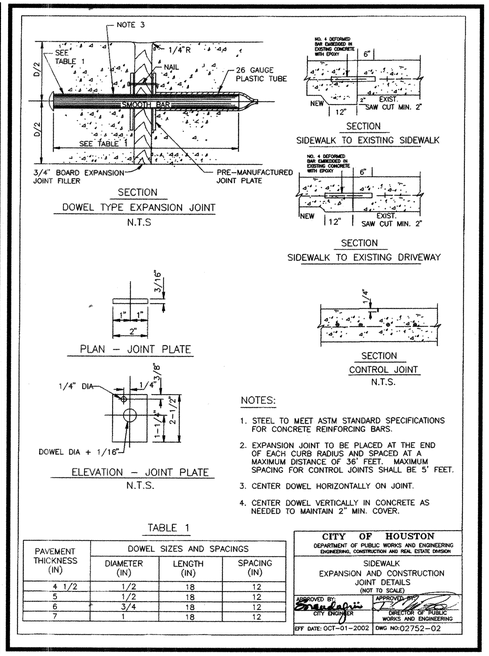
PAVEMENT THICKNESS (IN)	DOWEL SIZES AND SPACINGS: DIAMETER (IN)	LENGTH (IN)	SPACING (IN)
6	3/4	18	12
7	1	18	12
8	1	18	12
9	1 1/4	18	12
10	1 1/4	18	12
11	1 1/4	18	12
12	1 1/4	18	12

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: CITY ENGINEER — APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING

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



NOTES:

1. STEEL TO MEET ASTM STANDARD SPECIFICATIONS FOR CONCRETE REINFORCING BARS.
2. EXPANSION JOINT TO BE PLACED AT THE END OF EACH CURB RADIUS AND SPACED AT A MAXIMUM DISTANCE OF 36' FEET. MAXIMUM SPACING FOR CONTROL JOINTS SHALL BE 5' FEET.
3. CENTER DOWEL HORIZONTALLY ON JOINT.
4. CENTER DOWEL VERTICALLY IN CONCRETE AS NEEDED TO MAINTAIN 2" MIN. COVER.

TABLE 1

PAVEMENT THICKNESS (IN)	DOWEL SIZES AND SPACINGS: DIAMETER (IN)	LENGTH (IN)	SPACING (IN)
4 1/2	1/2	18	12
5	1/2	18	12
6	3/4	18	12
7	1	18	12

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

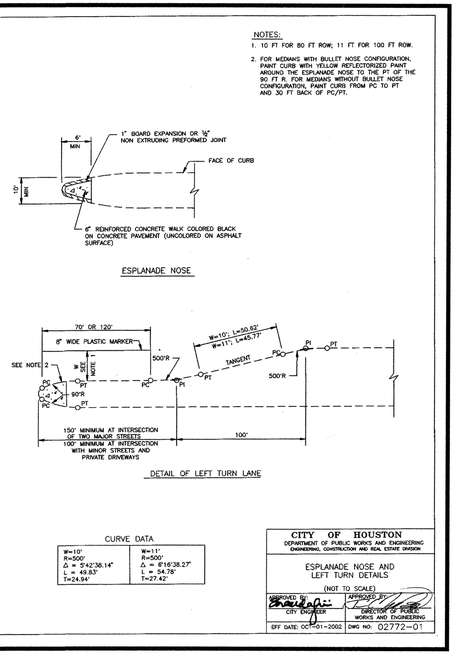
SIDEWALK EXPANSION AND CONSTRUCTION JOINT DETAILS
(NOT TO SCALE)

APPROVED BY: CITY ENGINEER — APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING

EFF DATE: OCT-01-2002 | DWG NO: 02752-02

NOTES:

1. 10 FT FOR 80 FT ROW; 11 FT FOR 100 FT ROW.
2. FOR MEDIANS WITH BULLET NOSE CONFIGUNTION, PAINT CURB WITH YELLOW REFLECTORIZED PAINT AROUND THE ESPLANADE NOSE TO THE POINT OF THE SO FT R. FOR MEDIANS WITH OUT BULLET NOSE CONFIGURATION, PAINT CURB FROM PC TO PT AND 30 FT BACK OF PC/PT.



CURVE DATA

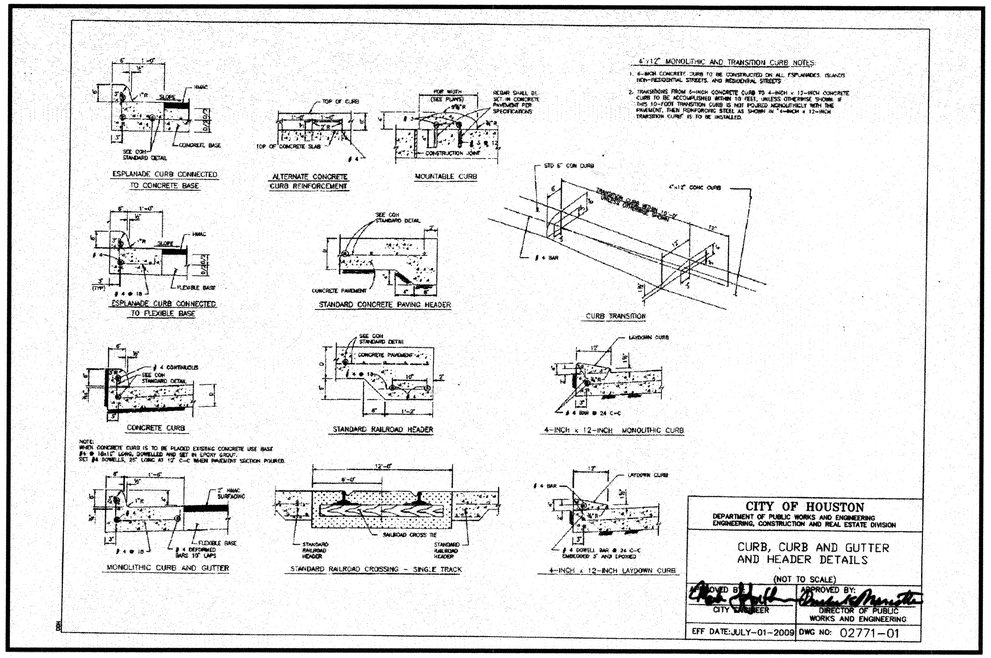
W=10' R=500' Δ = 5°42'38.14" L = 49.83' T=24.94'	W=11' R=500' Δ = 6°16'38.27" L = 54.78' T=27.42'

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

ESPLANADE NOSE AND LEFT TURN DETAILS
(NOT TO SCALE)

APPROVED BY: CITY ENGINEER — APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING

EFF DATE: OCT-01-2002 | DWG NO: 02772-01



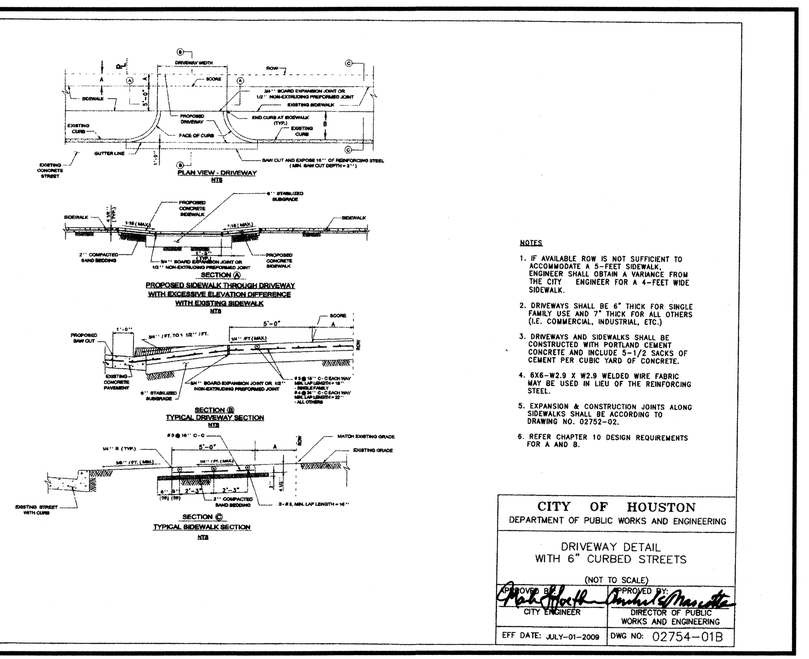
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
ENGINEERING, CONSTRUCTION AND REAL ESTATE DIVISION

CURB, CURB AND GUTTER AND HEADER DETAILS

(NOT TO SCALE)

APPROVED BY: CITY ENGINEER — APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING

EFF DATE: JULY-01-2009 | DWG NO: 02771-01



NOTES

1. IF AVAILABLE ROW IS NOT SUFFICIENT TO ACCOMMODATE A 5-FEET SIDEWALK, ENGINEER SHALL OBTAIN A VARIANCE FROM THE CITY ENGINEER FOR A 4-FEET WIDE SIDEWALK.
2. DRIVEWAYS SHALL BE 6" THICK FOR SINGLE FAMILY USE AND 7" THICK FOR ALL OTHERS (I.E. COMMERCIAL, INDUSTRIAL, ETC.)
3. DRIVEWAYS AND SIDEWALKS SHALL BE CONSTRUCTED WITH PORTLAND CEMENT CONCRETE AND INCLUDE 5-1/2 SACKS OF CEMENT PER CUBIC YARD OF CONCRETE.
4. 6X6-W2.9 X W2.9 WELDED WIRE FABRIC MAY BE USED IN LIEU OF THE REINFORCING STEEL.
5. EXPANSION & CONSTRUCTION JOINTS ALONG SIDEWALKS SHALL BE ACCORDING TO DRAWING NO. 02752-02.
6. REFER CHAPTER 10 DESIGN REQUIREMENTS FOR A AND B.

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

DRIVEWAY DETAIL WITH 6" CURBED STREETS

(NOT TO SCALE)

APPROVED BY: CITY ENGINEER — APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING

EFF DATE: JULY-01-2009 | DWG NO: 02754-01B

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SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

STATE OF TEXAS — JOHN D. RUDLOFF — 83386 — LICENSED PROFESSIONAL ENGINEER — 10/19/11

Job No.: 09-051 | Dwn By: F. Redburn
Date: May 2011 | Chkd By: D. Jorgensen

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

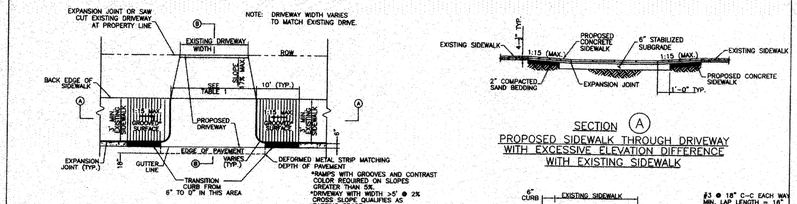
City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Pavement Details II

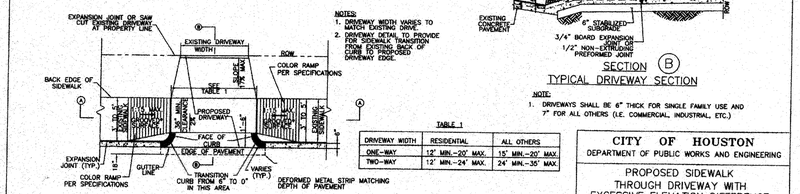
WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	
DRAWING SCALE	
VERT: NA HORZ: NA	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	

PUBLIC WORKS AND ENGINEERING — APPROVED — 48978 — LICENSED — STATE OF TEXAS

SHEET No: 116 OF 122



OPTION 1 – CURB LEVEL SIDEWALK
PLAN VIEW – DRIVEWAY

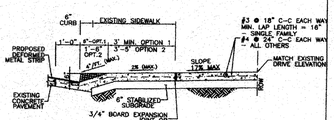


OPTION 2 – CURB LEVEL SIDEWALK
PLAN VIEW – DRIVEWAY

TABLE 1

DRIVEWAY WIDTH	RESIDENTIAL	ALL OTHERS
ONE-WAY	12' MIN.–20' MAX.	15' MIN.–20' MAX.
TWO-WAY	12' MIN.–24' MAX.	24' MIN.–35' MAX.

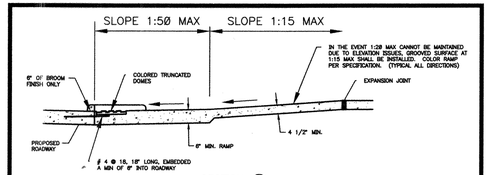
SECTION (A)
PROPOSED SIDEWALK THROUGH DRIVEWAY WITH EXCESSIVE ELEVATION DIFFERENCE WITH EXISTING SIDEWALK



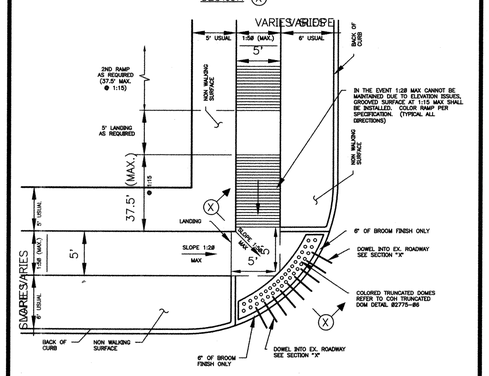
SECTION (B)
TYPICAL DRIVEWAY SECTION

NOTE:
1. DRIVEWAYS SHALL BE 6" THICK FOR SINGLE FAMILY USE AND 7" FOR ALL OTHERS (I.E. COMMERCIAL, INDUSTRIAL, ETC.)

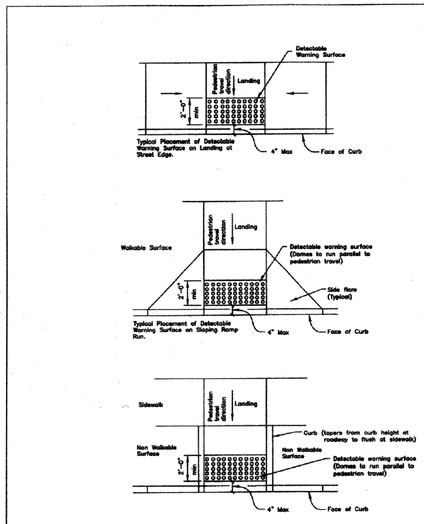
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
PROPOSED SIDEWALK THROUGH DRIVEWAY WITH EXCESSIVE ELEVATION DIFFERENCE
(NOT TO SCALE)
APPROVED BY: CITY ENGINEER — APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JULY-01-2009 — DWG NO: 02754-03



SECTION (X)



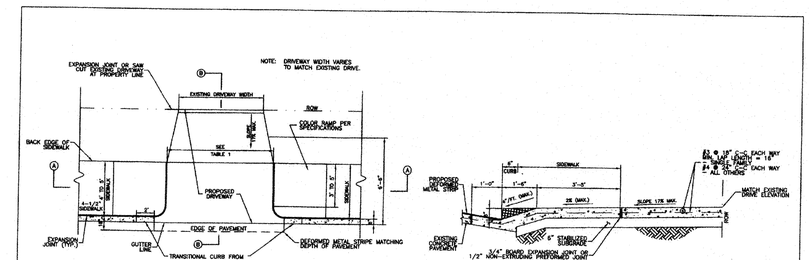
ALTERNATIVE CURB RAMP DETAIL
TO BE USED WHERE RAMPS AS SHOWN ON
COH 02775–02 WONT FIT DUE TO SIDEWALK LOCATION
N.T.S.



GENERAL NOTES FOR DETECTABLE WARNINGS

1. CURB RAMPS MUST CONTAIN A DETECTABLE WARNING SURFACE THAT CONSISTS OF RAISED TRUNCATED DOMES. THE SURFACE MUST CONTRAST VISUALLY WITH ADJOINING SURFACE, INCLUDING SIDE FLARES. FURNISH DARK BROWN OR DARK RED DETECTABLE WARNING SURFACE ADJACENT TO UNCOLORED CONCRETE, UNLESS SPECIFIED ELSEWHERE IN THE PLANS.
2. DETECTABLE WARNING SURFACES MUST BE SLIP RESISTANT AND NOT ALLOW WATER TO ACCUMULATE.
3. ALIGN TRUNCATED DOMES IN THE DIRECTION OF PEDESTRIAN TRAVEL WHEN ENTERING THE STREET.
4. OMIT
5. DETECTABLE WARNING SURFACES SHALL BE A MINIMUM OF 24" IN DEPTH IN THE DIRECTION OF PEDESTRIAN TRAVEL, AND EXTEND THE FULL WIDTH OF THE CURB RAMP OR LANDING WHERE THE PEDESTRIAN ACCESS ROUTE ENTERS THE STREET.
6. DETECTABLE WARNING SURFACES SHALL BE LOCATED SO THAT THE EDGE NEAREST THE CURB LINE IS 4" FROM THE EXTENSION OF THE FACE OF CURB. DETECTABLE WARNING SURFACES MAY BE CURVED ALONG THE CORNER RADIUS.
7. REFERENCE CURB RAMP DETAILS FOR RAMP GROOVED SURFACE.

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
DETECTABLE WARNING CURB RAMP DETAILS
(NOT TO SCALE)
APPROVED BY: CITY ENGINEER — APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: APR-18-2011 — DWG NO: 02775-06



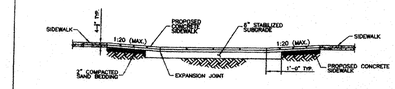
PLAN VIEW – DRIVEWAY
NTS

SECTION (B)
TYPICAL DRIVEWAY SECTION
NTS

NOTE:
1. DRIVEWAYS SHALL BE 6" THICK FOR SINGLE FAMILY USE AND 7" FOR ALL OTHERS (I.E. COMMERCIAL, INDUSTRIAL, ETC.)

TABLE 1

DRIVEWAY WIDTH	RESIDENTIAL	ALL OTHERS
ONE-WAY	12' MIN.–20' MAX.	15' MIN.–20' MAX.
TWO-WAY	12' MIN.–24' MAX.	24' MIN.–35' MAX.



SECTION (A)
PROPOSED SIDEWALK THROUGH DRIVEWAY WITH MINIMAL ELEVATION DIFFERENCE WITH EXISTING SIDEWALK
NTS

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
EXISTING/PROPOSED CURB LEVEL SIDEWALK CONDITIONS
(NOT TO SCALE)
APPROVED BY: CITY ENGINEER — APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JULY-01-2009 — DWG NO: 02754-04

NOTE: CURRENT CRITERIA CALLS FOR 5'–0" SIDEWALK WIDTH.

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HDR Engineering Inc. Texas Reg. No. F-754

JOHN D. RUDLOFF
4635 Southwest Freeway
Suite 1000
Houston, Texas 77027
(713) 622-9264
Fax (713) 622-9265

STATE OF TEXAS
JOHN D. RUDLOFF
83386
LICENSED
PROFESSIONAL ENGINEER
10/9/11

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051	Dwn By: F. Redburn
Date: May 2011	Chkd By: D. Jorgensen

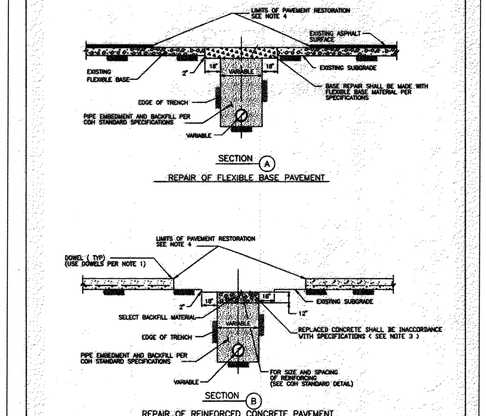
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Pavement Details III

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	
DRAWING SCALE	
VERT: NA HORZ: NA	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	

PUBLIC WORKS AND ENGINEERING
REVIEWED AND FILED
48978
NUMBER
TEXAS



SECTION (A)

REPAIR OF FLEXIBLE BASE PAVEMENT

SECTION (B)

REPAIR OF REINFORCED CONCRETE PAVEMENT

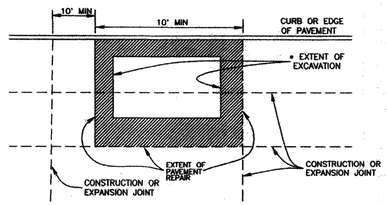
NOTE:

1. EXPOSE 15" OF REINFORCING STEEL AT PROPOSED SAWED JOINT. IF NO REINFORCING STEEL EXISTS, USE HORIZONTAL DOWELS. HORIZONTAL DOWELS SHALL BE # 6 BARS, 24" LONG, 24" C-C, DRILLED AND EMBEDDED 8" INTO THE CENTER OF THE EXISTING SLAB. WITH "PO ROC" OR EQUAL.
2. IF REINFORCED CONCRETE IS OVERLAYED WITH ASPHALT, REPLACE WITH 2" MIN HMAC SURFACING.
3. REFER TO STANDARD DETAIL 02751-01 FOR REINFORCING STEEL REQUIREMENTS
4. REFER TO STANDARD DETAIL 02951-01 FOR PAVEMENT RESTORATION LIMITS.

CITY OF HOUSTON DEPARTMENT OF PUBLIC WORKS AND ENGINEERING ENGINEERING, CONSTRUCTION AND REAL ESTATE DIVISION	
PAVEMENT REPAIR DETAILS FOR STREET CUTS (NOT TO SCALE)	
APPROVED BY: CITY ENGINEER	APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: OCT-01-2002	DWG NO: 02902-01

CONCRETE PAVEMENT RESTORATION

AGE OF PAVEMENT
GREATER THAN 5 YEARS

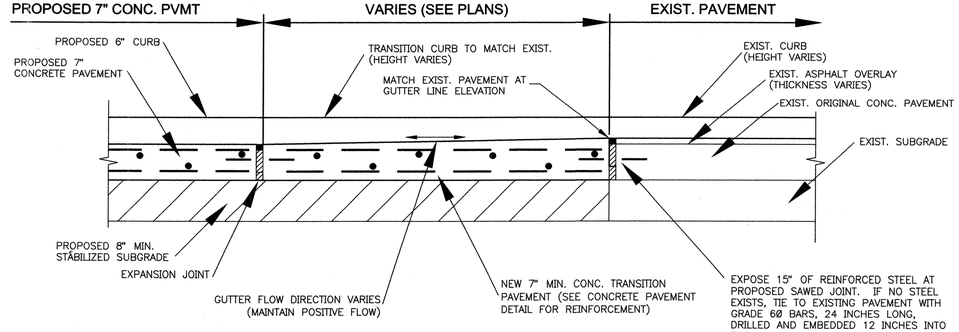


NOTES:

1. EXTENT OF PAVEMENT REPAIR SHALL BE PERPENDICULAR AND PARALLEL TO TRAVEL WAY.
2. WIDTH:
   REPLACE PANEL WIDTH TO NEAREST CONSTRUCTION OR EXPANSION JOINT BEYOND EDGE OF EXCAVATION.
3. LENGTH:
   a. MINIMUM LENGTH OF PAVEMENT REPAIR ALONG TRAVEL WAY IS 10' FROM THE NEAREST JOINT.
   b. IF EDGE OF EXCAVATION IS LESS THAN 10' FROM EXISTING CONSTRUCTION OR EXPANSION JOINT, REPLACE PAVEMENT TO EXISTING JOINT.
4. SAW CUT AND EXPOSE 15" OF REINFORCING STEEL AROUND EDGE OF PANEL REPLACEMENT. PROVIDE HORIZONTAL DOWELS (PER SPECIFICATION SECTION 02902-01) IF REINFORCING IS BROKEN OFF OR DOES NOT EXIST.
5. REPLACE CURB WHEN ADJACENT LANE IS REPLACED.
6. MAINTAIN EXPANSION JOINTS AT EXISTING LOCATIONS UNLESS OTHERWISE DIRECTED BY CITY ENGINEER.
7. SPECIALTY PAVEMENTS (IE: BRICK PAVERS) TO BE REPLACED WITH MATCHING PAVEMENT IN ALL CASES.
8. REPLACE PAVEMENT MARKINGS IN ACCORDANCE WITH CITY SPECIFICATIONS 02764 AND 02767.

* EXTENT OF EXCAVATION INCLUDES 18" OVERCUT AS SHOWN ON STANDARD DETAIL 02902-01.

CITY OF HOUSTON DEPARTMENT OF PUBLIC WORKS AND ENGINEERING ENGINEERING, CONSTRUCTION AND REAL ESTATE GROUP	
Street Cut Pavement Replacement CONCRETE PAVEMENT OVER 5 YRS IN AGE (NOT TO SCALE)	
APPROVED BY: CITY ENGINEER	APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JUNE 2002	DWG NO: 02951-02



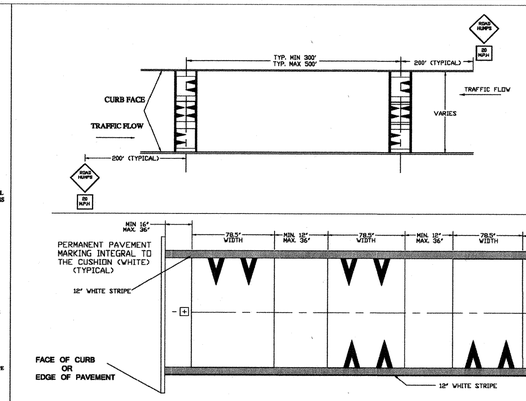
CONCRETE TRANSITION DETAIL

PROP. CONCRETE TRANSITION HATCH

GENERAL NOTES

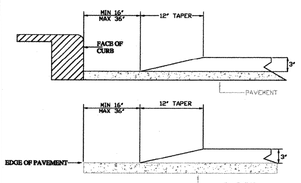
1. SPEED CUSHIONS WILL BE CONSTRUCTED AT LOCATIONS DESIGNED BY TRAFFIC AND TRANSPORTATION DIVISION.
2. CONTRACTOR SHALL CONTACT THE CONSTRUCTION COORDINATOR BEFORE ANY STREET IS TEMPORARILY CLOSED FOR CONSTRUCTION.
3. THE DISTANCE BETWEEN SPEED CUSHIONS WILL BE DETERMINED BY TRAFFIC AND TRANSPORTATION DIVISION.
4. TRAFFIC AND TRANSPORTATION DIVISION WILL IDENTIFY THE LOCATIONS OF ALL SIGNS RELATED TO THE SPEED CUSHIONS.
5. NO PART OF A SPEED CUSHIONS SHALL BE LOCATED IN FRONT OF DRIVEWAY APPROACHS; RATHER THEY SHOULD BE A MINIMUM OF 6 FEET FROM THE EDGE OF A DRIVEWAY, WHEN PRACTICAL.
6. SPEED CUSHIONS SHOULD BE PLACED AS CLOSE AS POSSIBLE TO THE PROPERTY LINES INSTEAD OF MID - LOT LOCATION, WHERE PRACTICAL.
7. SPEED CUSHIONS SHOULD BE INSTALLED AT A RIGHT ANGLE TO THE CENTERLINE TANGENT OF THE ROADWAY.
8. TRAFFIC CONTROL CONSISTING OF SIGNS SHALL BE PROVIDED TO ADVISE ROADWAY USER OF SPEED CUSHIONS PRESENCE, TRAFFIC SIGNS, AND PAVEMENT MARKINGS SHALL CONFORM TO THE LATEST REQUIREMENTS OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD).
9. ALL SIGNS AND PAVEMENT MARKINGS WILL BE PROVIDED AND INSTALLED BY THE CONTRACTOR.
10. CONTRACTOR SHALL NOT OPEN SPEED CUSHIONS TO TRAFFIC UNTILL ALL REQUIRED WARNING SIGNS AND PAVEMENT MARKINGS ARE COMPLETED.
11. CONTRACTOR WILL MAINTAIN TEMPORARY MARKINGS UNTIL PERMANENT MARKINGS ARE INSTALLED.
12. CONTRACTOR SHALL COMPLETE THE CUSHION INSTALLATION TO FORM ONE COMPLETE HUMP BEFORE LEAVING THE JOB SITE.
13. CONTRACTOR SHALL WORK ONE HALF OF THE STREET AT A TIME AND MAINTAIN TWO - WAY TRAFFIC WITH CERTIFIED FLAGGER.
14. SPEED CUSHIONS SHALL BE MODULAR WITH DESIGN MADE OF 100% RECYCLED RUBBER AND POLYURETHANE BINDER COMPRESSION MOLDED AND HAVE THE FOLLOWING PROPERTIES:
    - SHORE A HARDNESS - 65 MINIMUM
    - SPECIFIC GRAVITY - 1.13
    - SKID RESISTANCE - 85 (DRY)
    - TENSILE STRENGTH - 500 PSI MINIMUM
    - DEFORM RATE - NONE (100% RECOVERY AFTER COMPRESSION).

    THEY SHALL BE BLACK IN COLOR WITH WHITE REFLECTIVE ARROWS MADE OF PAVEMENT MARKING TAPE AND MOLDED INTO THE RUBBER.
15. SPEED CUSHIONS SHALL BE CONSTRUCTED PER ROADSAFE INTERNATIONAL ROAD KOP - SPEED CUSHION OR EQUAL AND INSTALLED PER MANUFACTURERS RECOMMENDATIONS.

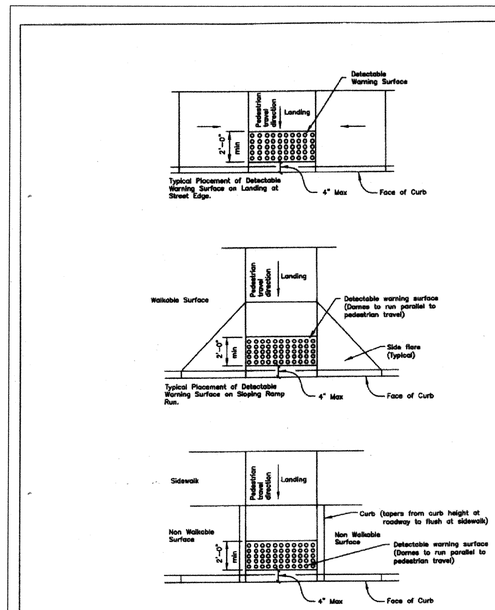


TYPICAL SPEED CUSHIONS ARRANGEMENT FOR A GIVEN PAVEMENT WIDTH

PAVEMENT WIDTH (FT)	No OF CUSHIONS	GAP (IN)	CUSHION (IN)	GAP (IN)	CUSHION (IN)	GAP (IN)	CUSHION (IN)	GAP (IN)	CUSHION (IN)	GAP (IN)	CUSHION (IN)	GAP (IN)
26	3	18.5	78.5	19.5	78.5	19.5	78.5	18.5				
28	3	24.5	78.5	25.5	78.5	25.5	78.5	24.5				
30	3	30.5	78.5	31.5	78.5	31.5	78.5	30.5				
32	4	16	78.5	12.5	78.5	12.5	78.5	12.5	78.5	16		
34	4	18.5	78.5	19	78.5	19	78.5	19	78.5	18.5		
36	4	23.5	78.5	23.5	78.5	23.5	78.5	23.5	78.5	23.5		
38	4	28.5	78.5	28.5	78.5	28	78.5	28.5	78.5	28.5		
40	4	33	78.5	33	78.5	33.5	78.5	33	78.5	33		
42	5	18.5	78.5	18.5	78.5	18.5	78.5	18.5	78.5	18.5	78.5	18.5
44	5	22.5	78.5	22.5	78.5	22.5	78.5	22.5	78.5	22.5	78.5	22.5



CITY OF HOUSTON DEPARTMENT OF PUBLIC WORKS AND ENGINEERING	
SPEED CUSHIONS	
APPROVED BY: M.Y.E.	DWG No: 1 of 1
DESIGNED BY: J.B.	NOT TO SCALE



GENERAL NOTES FOR DETECTABLE WARNINGS

1. CURB RAMPS MUST CONTAIN A DETECTABLE WARNING SURFACE THAT CONSISTS OF RAISED INDICATED DOMES. THE SURFACE MUST CONTRAST VISUALLY WITH ADJOINING SURFACE, INCLUDING SIDE FLOORS. FURNISH DARK BROWN OR DARK RED DETECTABLE WARNING SURFACE ADJACENT TO UNCOLORED CONCRETE, UNLESS SPECIFIED ELSEWHERE IN THE PLANS.
2. DETECTABLE WARNING SURFACES MUST BE SLIP RESISTANT AND NOT ALLOW WATER TO ACCUMULATE.
3. ALIGN TRUNCATED DOMES IN THE DIRECTION OF PEDESTRIAN TRAVEL WHEN ENTERING THE STREET.
4. OMIT
5. DETECTABLE WARNING SURFACES SHALL BE A MINIMUM OF 24" IN DEPTH IN THE DIRECTION OF PEDESTRIAN TRAVEL, AND EXTEND THE FULL WIDTH OF THE CURB RAMP OR LANDING WHERE THE PEDESTRIAN ACCESS ROUTE ENTERS THE STREET.
6. DETECTABLE WARNING SURFACES SHALL BE LOCATED SO THAT THE EDGE NEAREST THE CURB LINE IS 4" FROM THE EXTENSION OF THE FACE OF CURB.
   DETECTABLE WARNING SURFACES MAY BE CURVED ALONG THE CORNER RADIUS.
7. REFERENCE CURB RAMP DETAILS FOR RAMP GROOVED SURFACE.

CITY OF HOUSTON DEPARTMENT OF PUBLIC WORKS AND ENGINEERING	
DETECTABLE WARNING CURB RAMP DETAILS (NOT TO SCALE)	
APPROVED BY: CITY ENGINEER	APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: APR-18-2011	DWG NO: 02775-06

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Houston, Texas 77027
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Fax (713) 622-9265

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

STATE OF TEXAS · JOHN D. RUDLOFF · 83396 · LICENSED · PROFESSIONAL ENGINEER
10/19/11

Job No.: 09-051	Dwn By: F. Redburn
Date: May 2011	Chkd By: D. Jorgensen

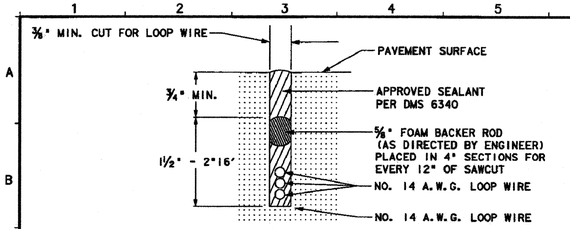
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Pavement Details IV

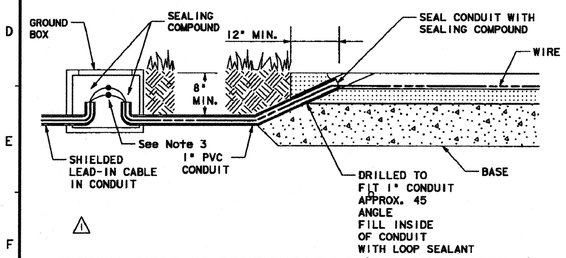
WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	
DRAWING SCALE	
VERT: NA HORZ: NA	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	
SHEET No: 118 OF 122	

PUBLIC WORKS AND ENGINEERING · FILED · 48978 · NUMBER

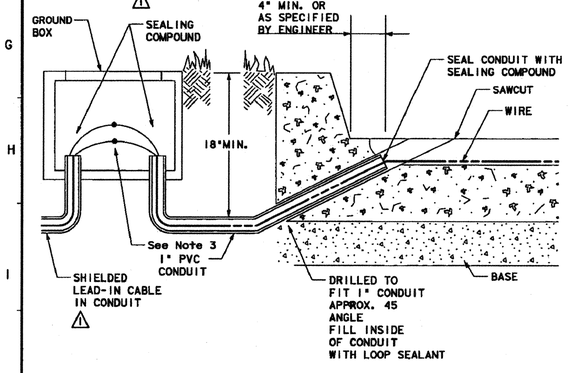


LOOP SAW CUT CROSS-SECTION

* SAWCUTS IN BRIDGE DECKS ARE TYPICALLY 1" DEPTH MAXIMUM SAWCUTS IN BRIDGE DECKS AND ACROSS EXPANSION JOINTS SHALL BE AS APPROVED BY ENGINEER



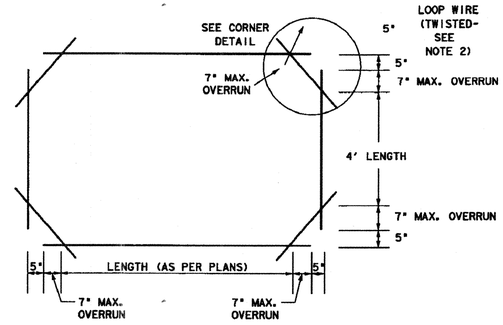
TYPICAL LEAD IN CONFIGURATION (WITHOUT CURBING)



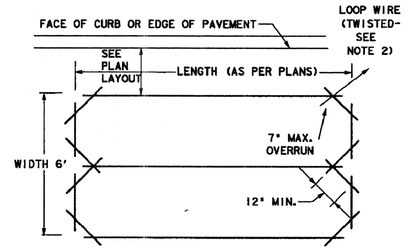
TYPICAL LEAD IN CONFIGURATION (WITH CURBING)

TYPICAL LOOP DETECTOR LAYOUT

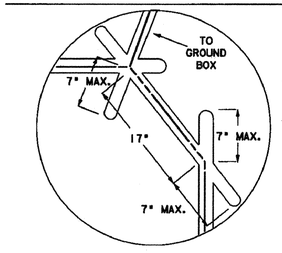
(AS SPECIFIED IN PLANS)



RECTANGULAR

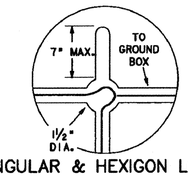


QUADRAPOLE



RECTANGULAR & HEXIGON LOOP

SAWCUT CORNER DETAIL
7" OVERRUN BASED ON
24" DIAMETER SAW BLADE



RECTANGULAR & HEXIGON LOOP (ALT.)

DRILLED CORNER DETAIL

TYPICAL CORNER DETAILS

GENERAL NOTES:

1. The pavement cut is to be made with a concrete saw to neat lines and loose material removed. The cut shall be clean and dry when the wire and sealing compound is placed.
2. Loop wire shall be 14 AWG Stranded Type XHHW. Wire from the loop to the ground box shall be twisted a minimum of 5 turns per foot. No splices shall be permitted in the loop or in the run to the ground box.
3. The home run cable from the pull box to the controller shall be IMSA 50-2 shielded cable and shall be soldered to the loop wire. The solder joints shall be sealed with Scotchcoat or other method acceptable to the Engineer. The shield shall be grounded only at the controller end. Loop home run cable shall be two conductor 14 AWG shielded, Type XHHW.
4. All wire placed in the saw cut shall be sealed by fully encapsulating it in a sealant acceptable to the Engineer. Sealing compound shall be in accordance with DMS 6340.
5. The loop location, configuration and number of turns shall be as indicated on the plans or as directed by the Engineer.

Recommended Number of Turns for Loop Detectors

LOOP PERIMETER SIZE (FT.)	NUMBER OF TURNS	APPROXIMATE LOOP SIZES INCLUDED
24' or Less	3 or 4	5' x 5', 6' x 6'
25' - 110'	2 or 3	6' x 10', 6' x 45'
110' or More	1 or 2	6' x 50' or Longer

6. A separate saw cut shall be made from each loop to the edge of pavement or as specified by the Engineer.
7. Splices between the loop lead-in cable and loop detector shall be made only in the ground box near the loop it is serving.
8. Circular loops may use prewound loops encased in continuous pvc tubing. Sawcut width may be adjusted to accommodate tubing.
9. The lead-in wire in the circular loop shall be coiled at the 3 inch drilled corner to reduce bending stress.
10. Loop duct may be used as specified by Engineer.

For additional information refer to "Texas Traffic Signal Detector" manual, TTI Report 1163-1.

NO.	DATE	REVISION	BY:	CHKD:	APPROVAL (SIGNATURE):

CITY OF HOUSTON

PUBLIC WORKS & ENGINEERING DEPARTMENT
TRAFFIC SIGNAL ENGINEERING
AND OPERATIONS SECTION

...\2009 Standards\02893-11.dgn

TRAFFIC SIGNAL DETAILS

LOOP DETECTOR INSTALLATION DETAILS

DWG. NO. 02893-11 | SHEET NO.

HDR | CLAUNCH & MILLER
Engineering Consultants
4635 Southwest Freeway, Suite 1000• Houston, Texas 77027
(713) 622-9264• Fax (713) 622-9265• www.hdrinc.com
HDR Engineering Inc. Texas Reg. No. F-754

JOHN D. RUDLOFF
4635 Southwest Freeway
Suite 1000
Houston, Texas 77027
(713) 622-9264
Fax (713) 622-9265

STATE OF TEXAS — JOHN D. RUDLOFF — 83386 — LICENSED — PROFESSIONAL ENGINEER — 10/9/11

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 | Dwn By: F. Redburn
Date: May 2011 | Chkd By: D. Jorgensen

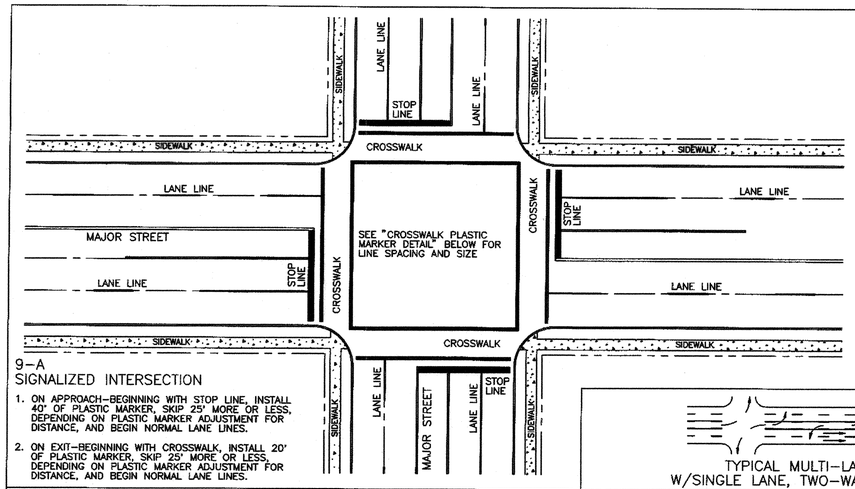
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Loop Detector Installation Details

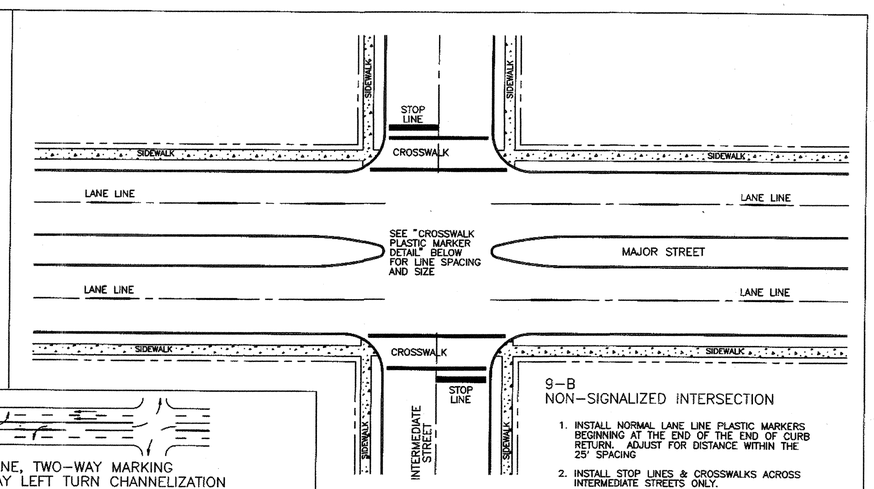
WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	PUBLIC WORKS AND ENGINEERING — APPROVED AND FILED — 48978 — NUMBER — TEXAS
DRAWING SCALE	
VERT: NA HORZ: NA	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	
SHEET No: 119 OF 122	

MB



9-A
SIGNALIZED INTERSECTION

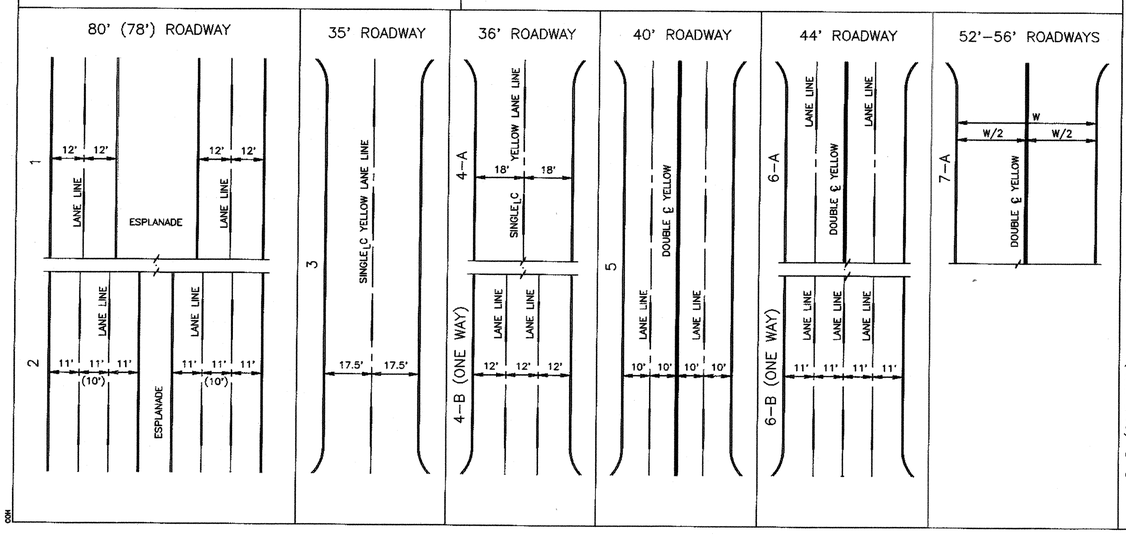
1. ON APPROACH-BEGINNING WITH STOP LINE, INSTALL 40' OF PLASTIC MARKER, SKIP 25' MORE OR LESS, DEPENDING ON PLASTIC MARKER ADJUSTMENT FOR DISTANCE, AND BEGIN NORMAL LANE LINES.
2. ON EXIT-BEGINNING WITH CROSSWALK, INSTALL 20' OF PLASTIC MARKER, SKIP 25' MORE OR LESS, DEPENDING ON PLASTIC MARKER ADJUSTMENT FOR DISTANCE, AND BEGIN NORMAL LANE LINES.

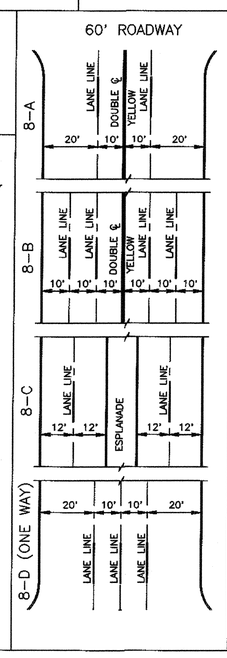


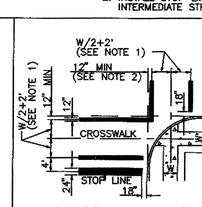
9-B
NON-SIGNALIZED INTERSECTION

1. INSTALL NORMAL LANE LINE PLASTIC MARKERS BEGINNING AT THE END OF THE END OF CURB RETURN. ADJUST FOR DISTANCE WITHIN THE 25' SPACING
2. INSTALL STOP LINES & CROSSWALKS ACROSS INTERMEDIATE STREETS ONLY.

TYPICAL MULTI-LANE, TWO-WAY MARKING
W/SINGLE LANE, TWO-WAY LEFT TURN CHANNELIZATION





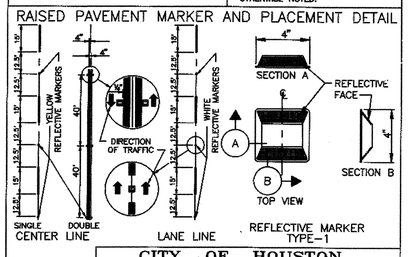


CROSSWALK PLASTIC MARKER DETAIL

GENERAL NOTES

1. MINIMUM CROSSWALK WIDTH, 8' C-C.
2. CROSSWALKS SHALL BE 12" WIDTH APPLIED AS INDICATED IN "CROSSWALK PLASTIC MARKER DETAIL". STOP LINES SHALL BE 24" WIDE OR 2-12" WIDE STRIPES.
3. LANE LINES, SINGLE & DOUBLE 5" SHALL BE 4" WIDE REFLECTORIZED PLASTIC MARKINGS.
4. ALL PLASTIC MARKERS SHALL BE WHITE UNLESS OTHERWISE NOTED.
5. ROADWAY WIDTHS OF 27' OR LESS SHALL HAVE NO LONGITUDINAL MARKINGS.
6. ALL TRAVERSE MARKINGS SHALL END 18' FROM FACE OF CURB.
7. FOR SKEW INTERSECTIONS AND STREET WIDTHS NOT SHOWN, SEE DEPARTMENT OF TRAFFIC AND TRANSPORTATION.
8. ALL DIMENSIONS SHOWN TO CENTER OF PLASTIC MARKINGS, UNLESS OTHERWISE NOTED.

RAISED PAVEMENT MARKER AND PLACEMENT DETAIL



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

PAVEMENT MARKING DETAILS

(NOT TO SCALE)

APPROVED BY: CITY ENGINEER
APPROVED BY: DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: OCT-01-2000
DWG NO: 02763-01

HDR | CLAUNCH & MILLER
Engineering Consultants
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Fax (713) 622-9265

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

STATE OF TEXAS · JOHN D. RUDLOFF · 85396 · LICENSED PROFESSIONAL ENGINEER · 10/19/11

Job No.: 09-051	Dwn By: F. Redburn
Date: May 2011	Chkd By: D. Jorgensen

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Pavement Marking Details

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	
DRAWING SCALE	
VERT: NA HORZ: NA	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	
SHEET No: 120 OF 122	

PUBLIC WORKS AND ENGINEERING · REVIEWED AND FILED · 48978 · NUMBER

MK	Streets	Center Sta.	Left/Right	Sheet No.	Prop. S.Y.	Exist Width @ R.O.W.	Top of Driveway @ R.O.W.	Right of Entry Agreement Required to Construct Driveway
A1	Latma Dr.	2+39.25	Right	25	36	18.59	49.34	*
A2	Latma Dr.	2+42.25	Left	25	31	15.95	48.56	
A3	Latma Dr.	4+38.13	Right	25	23	10.56	48.67	
A4	Latma Dr.	5+00.91	Left	26	22	7.74	48.23	
A5	Latma Dr.	5+24.68	Left	26	30	16.03	48.98	
A6	Latma Dr.	5+96.48	Right	26	24	9.42	48.63	
A7	Latma Dr.	6+78.57	Right	26	23	8.77	48.67	
A8	Latma Dr.	7+47.80	Right	26	22	7.86	48.93	*
A9	Latma Dr.	7+64.26	Left	27	32	16.47	48.60	
A10	Latma Dr.	8+12.57	Left	27	33	17.26	48.71	*
A11	Latma Dr.	8+17.77	Right	27	23	8.33	48.80	
A12	Latma Dr.	8+78.31	Right	27	23	10.19	48.80	
A13	Latma Dr.	9+43.03	Right	27	22	7.7	48.75	
A14	Latma Dr.	10+08.09	Right	27	22	7.93	48.79	
A15/16	Latma Dr.	10+46.02	Left	27	45	12.98/8.05	48.71/48.52	
A17	Latma Dr.	10+79.76	Right	27	23	9.94	48.93	
A18	Latma Dr.	11+40.43	Right	28	22	7.86	48.86	
A19	Latma Dr.	13+38.12	Right	28	22	7.73	49.45	*
A20	Latma Dr.	13+44.26	Left	28	22	8.06	48.92	
A21	Latma Dr.	14+03.76	Right	29	22	8.02	49.38	*
A22	Latma Dr.	14+18.69	Left	29	31	16.13	49.21	*
A23	Latma Dr.	14+69.05	Right	29	23	8.83	49.37	*
A24	Latma Dr.	15+33.53	Right	29	22	7.95	49.53	*
A25	Latma Dr.	16+00.88	Right	29	22	7.93	49.15	
A26	Latma Dr.	16+53.35	Left	29	22	7.45	49.33	
A27	Latma Dr.	16+63.17	Right	29	22	6.83	49.33	
A28	Latma Dr.	17+28.94	Right	30	22	7.98	49.92	*
A29	Latma Dr.	17+97.86	Right	30	16	END @ SIDEWALK		
A30	Latma Dr.	18+58.44	Right	30	22	7.95	49.99	
A31	Latma Dr.	19+26.76	Right	30	23	8.73	49.79	
A32	Latma Dr.	19+69.76	Left	30	34	17.78	49.82	
A33	Latma Dr.	19+89.88	Right	30	23	10.11	49.72	
A34	Latma Dr.	20+54.53	Right	31	22	8.19	49.72	
A35	Latma Dr.	21+19.46	Right	31	22	7.86	49.25	
A36	Latma Dr.	21+83.64	Right	31	22	7.9	49.56	
A37	Latma Dr.	22+48.85	Right	31	22	8.11	49.90	*
A38	Latma Dr.	23+17.24	Right	31	23	11.02	50.14	*
A39	Latma Dr.	23+23.88	Left	31	39	17.12	49.63	
A40	Latma Dr.	23+79.75	Right	31	22	7.96	50.01	
A41	Latma Dr.	23+88.29	Left	31	22	7.95	50.19	
A42	Latma Dr.	24+44.80	Right	32	22	7.92	49.85	*
A43	Latma Dr.	24+49.50	Left	32	23	8.86	49.70	
A44	Latma Dr.	25+09.89	Right	32	22	7.74	49.85	*
A45	Latma Dr.	25+08.50	Left	32	23	8.33	49.83	
B1	Murworth Dr.	6+14.39	Left	33	34	5.16	48.10	*
B2	Murworth Dr.	6+71.69	Left	33	24	11.9	48.15	*
B3	Murworth Dr.	6+70.97	Right	33	37	19.37	48.00	
B4	Murworth Dr.	7+26.43	Right	33	23	10.73	48.22	*
B5	Murworth Dr.	7+37.84	Left	33	23	9.23	48.41	*
B6	Murworth Dr.	7+95.33	Right	33	22	7.88	47.91	
B7	Murworth Dr.	8+15.51	Left	33	32	16.3	48.36	
B8	Murworth Dr.	8+64.18	Right	33	22	7.93	48.05	
B9	Murworth Dr.	8+73.97	Left	33	23	9.02	48.41	
B10	Murworth Dr.	9+35.52	Right	33	24	11.47	48.51	*
B11	Murworth Dr.	9+42.66	Left	33	22	8.11	48.17	*
B12	Murworth Dr.	10+03.31	Right	34	22	7.32	48.27	*
B13	Murworth Dr.	10+09.90	Left	34	22	7.99	47.78	*
B14	Murworth Dr.	10+73.61	Right	34	22	8.01	48.30	*
B15	Murworth Dr.	10+77.07	Left	34	23	8.55	47.97	
B16	Murworth Dr.	11+45.41	Right	34	22	8.01	48.01	*
B17	Murworth Dr.	11+45.32	Left	34	23	8.23	48.12	
B18	Murworth Dr.	12+17.05	Left	34	23	9.95	48.15	
B19	Murworth Dr.	12+82.88	Left	34	22	7.9	47.63	
B20	Murworth Dr.	13+51.11	Left	34	22	7.9	48.04	*
B21	Murworth Dr.	13+73.09	Right	34	22	8.04	48.14	*
B22	Murworth Dr.	14+18.90	Left	35	22	8	48.09	*
B23	Murworth Dr.	14+86.00	Left	35	22	7.97	47.89	*
B24	Murworth Dr.	15+59.59	Left	35	24	12.04	47.99	
B25	Murworth Dr.	16+22.95	Left	35	22	7.97	47.86	
B26	Murworth Dr.	16+83.95	Right	35	33	16.9	48.14	
B27	Murworth Dr.	16+91.44	Left	35	22	7.91	47.76	
C1	Silver Springs Dr.	3+60.81	Left	37	22	8.18	49.07	*
C2	Silver Springs Dr.	3+55.15	Right	37	23	8.95	48.59	
C3	Silver Springs Dr.	4+21.52	Left	37	22	7.89	48.41	
C4	Silver Springs Dr.	4+17.95	Right	37	31	15.72	48.81	
C5	Silver Springs Dr.	4+91.02	Left	37	22	7.93	48.28	*
C6	Silver Springs Dr.	4+87.77	Right	37	22	7.88	47.98	
C7	Silver Springs Dr.	5+50.72	Left	38	25	9.43	48.20	*
C8/9	Silver Springs Dr.	5+84.69	Left	38	52	14.73/12.83	48.33/48.40	*

MK	Streets	Center Sta.	Left/Right	Sheet No.	Prop. S.Y.	Exist Width @ R.O.W.	Top of Driveway @ R.O.W.	Temp Const. Esmt. to Constr. Driveway as Per City Standards
D1	Latma Crt.	2+43.87	Left	39	43	18.31	48.46	
D2	Latma Crt.	2+64.24	Left	39	23	9.34	48.62	*
D3	Latma Crt.	2+61.75	Left	39	23	7.71	48.47	
D4	Latma Crt.	2+41.43	Right	39	23	8.52	48.51	*
E1	Kapri Ln.	2+64.63	Left	40	24	7.88	48.42	*
E2	Kapri Ln.	2+87.97	Right	40	23	9.07	48.69	
E3	Kapri Ln.	3+31.17	Left	40	24	7.94	48.58	
E4	Kapri Ln.	3+51.75	Right	40	23	8.21	48.46	
E5	Kapri Ln.	3+98.44	Left	40	24	8.68	48.35	
E6	Kapri Ln.	4+13.47	Right	40	23	9.66	48.27	
E7	Kapri Ln.	4+65.12	Left	41	24	9.89	48.09	
E8	Kapri Ln.	4+78.60	Right	41	22	7.42	48.36	
E9	Kapri Ln.	5+30.71	Left	41	23	7.78	48.22	
E10	Kapri Ln.	5+39.88	Right	41	23	8.78	48.65	*
E11	Kapri Ln.	5+68.27	Right	41	49	15.83	48.34	*
F1	Marlive Ln.	3+17.39	Left	42	37	19.3	48.87	
F2	Marlive Ln.	3+19.67	Right	42	44	23.07	48.96	*
F3	Marlive Ln.	3+90.20	Right	42	23	10.08	49.12	
F4	Marlive Ln.	3+95.58	Left	42	22	7.95	49.18	
F5	Marlive Ln.	4+19.19	Right	42	24	7.85	49.08	*
F6	Marlive Ln.	4+61.17	Left	42	23	11.18	49.23	
F7	Marlive Ln.	4+72.45	Right	42	34	17.6	49.35	
F8	Marlive Ln.	5+29.99	Left	42	22	7.54	49.08	
F9	Marlive Ln.	5+46.40	Right	42	24	8.05	48.81	*
F10	Marlive Ln.	5+95.86	Left	43	22	7.94	48.90	
F11	Marlive Ln.	6+10.09	Right	43	24	7.92	48.90	*
F12	Marlive Ln.	6+63.23	Left	43	22	8.47	48.51	
F13	Marlive Ln.	6+72.49	Right	43	22	7.8	48.19	*
F14	Marlive Ln.	7+35.15	Left	43	38	19.6	48.38	
F15	Marlive Ln.	7+37.14	Right	43	22	7.9	48.43	
F16	Marlive Ln.	7+99.21	Right	43	23	9.07	48.18	
F17	Marlive Ln.	8+15.43	Left	43	22	5.7	49.15	*
F18	Marlive Ln.	8+33.82	Right	43	32	16.42	48.23	*
G1	Timberside Dr.	8+40.34	Left	44	30	15.74	49.25	
G2	Timberside Dr.	9+12.90	Right	44	25	7.96	49.69	*
G3	Timberside Dr.	9+22.72	Left	44	23	7.89	49.32	*
G4	Timberside Dr.	9+36.51	Right	44	37	16.85	49.19	
G5	Timberside Dr.	10+09.34	Right	44	26	8.91	49.44	*
G6	Timberside Dr.	10+89.74	Right	44	37	17.1	49.00	*
G7	Timberside Dr.	12+16.05	Left	45	23	7.9	49.01	
G8	Timberside Dr.	12+22.64	Right	45	25	7.94	48.95	
G9	Timberside Dr.	12+38.28	Left	45	32	16.24	48.93	*
G10	Timberside Dr.	12+91.30	Right	45	40	18.79	48.83	
G11	Timberside Dr.	13+73.11	Right	45	26	10.13	48.34	*
G12	Timberside Dr.	14+38.29	Left	45	32	16.45	48.57	*
G13	Timberside Dr.	14+44.18	Right	45	38	17.91	48.36	*
G14	Timberside Dr.	14+66.26	Right	45	25	8.34	48.55	*
G15	Timberside Dr.	15+16.89	Left	46	23	9.9	47.90	
H1	Durhill St.	2+12.12	Right	47	32	16.22	49.02	*
H2	Durhill St.	2+84.09	Right	47	32	16.51	49.22	*
H3	Durhill St.	2+79.67	Left	47	22	7.78	48.95	
H4	Durhill St.	3+42.67	Left	47	23	8.87	49.14	*
H5	Durhill St.	3+69.10	Right	47	22	7.8	49.10	
H6/7	Durhill St.	4+11.14	Left	47	36	9.45/9.03	49.08	
H8/9	Durhill St.	4+46.59	Right	47	35	7.90/9.19	49.47/49.52	
H10	Durhill St.	5+22.84	Right	48	35	9.39	49.82	
H11	Durhill St.	5+93.73	Right	48	23	8.09	49.27	
H12/13	Durhill St.	7+33.25	Right	48	48	10.33/10.89	49.64/49.49	
H14	Durhill St.	7+36.92	Left	48	32	16.45	49.34	
H15	Durhill St.	8+07.83	Right	49	22	7.76	49.36	
H16	Durhill St.	8+82.55	Right	49	23	8	49.01	
H17	Durhill St.	9+55.13	Right	49	23	8.98	48.83	
H18	Durhill St.	9+95.09	Left	49	34	17.61	49.38	
H19	Durhill St.	10+29.03	Left	49	23	9.09	49.10	
H20	Durhill St.	10+23.88	Right	49	23	9.18	49.19	
H21	Durhill St.	10+92.36	Left	49	22	7.95	49.10	*
H22	Durhill St.	10+94.26	Right	49	22	8.05	49.07	*
H23	Durhill St.	11+56.89	Right	50	22	7.89	48.96	
H24	Durhill St.	11+57.01	Left	50	23	8.24	48.89	*
H25	Durhill St.	12+24.29	Left	50	23	10.8	48.59	*
H26	Durhill St.	12+22.15	Right	50	23	8.32	48.85	
H27	Durhill St.	12+87.62	Left	50	22	7.9	48.56	
H28	Durhill St.	12+87.67	Right	50	22	7.96	48.75	
H29	Durhill St.	13+51.89	Right	50	22	7.95	48.38	
H30	Durhill St.	13+52.10	Left	50	22	7.8	48.65	
H31	Durhill St.	14+18.25	Right	51	22	8.12	48.32	
H32	Durhill St.	14+68.46	Left	51	22	7.74	48.52	
H33	Durhill St.	14+90.48	Left	51	25	12.88	48.31	
H34	Durhill St.	15+07.75	Right	51	31	16.21	48.60	*
H35	Durhill St.	17+33.33	Right	51	33	16.81	48.30	
H36	Durhill St.	17+41.08	Left	51	39	20.24	48.32	
H37	Durhill St.	18+01.47	Left	51	41	21.17	48.50	

MK	Streets	Center Sta.	Left/Right	Sheet No.	Prop. S.Y.	Exist Width @ R.O.W.	Top of Driveway @ R.O.W.	Temp Const. Esmt. to Constr. Driveway as Per City Standards
I1	Elmridge St.	2+03.91	Left	52	32	16.22	49.61	
I2	Elmridge St.	2+36.52	Right	52	34	17.15	49.44	*
I3	Elmridge St.	2+73.85	Right	52	32	15.82	49.85	*
I4	Elmridge St.	2+86.07	Left	52	34	16.97	49.71	
I5	Elmridge St.	3+42.82	Right	52	23	6.78	49.81	
I6	Elmridge St.	3+58.91	Left	52	29	14.29	49.75	
I7	Elmridge St.	4+13.39	Left	53	23	8.22	49.77	
I8	Elmridge St.	4+18.91	Right	53	23	8.69	49.96	*
I9	Elmridge St.	4+73.63	Left	53	23	8.68	49.99	
I10	Elmridge St.	4+91.21	Right	53	23	7.86	50.15	
I11	Elmridge St.	5+34.41	Left	53	23	9	49.89	
I12	Elmridge St.	5+95.26	Left	53	23	8.89	49.58	
I13	Elmridge St.	6+24.17	Right	53	24	9.79	49.99	
I14	Elmridge St.	6+56.83	Left	53	23	8.94	49.58	
I15/16	Elmridge St.	7+07.81	Right	54	5	10.84/10.47	49.56	
I17	Elmridge St.	7+16.90	Left	54	23	8.56	49.78	
I18	Elmridge St.	7+80.28	Left	54	23	8.97	49.39	*
I19	Elmridge St.	8+24.29	Right	54	34	17.1	49.63	*
I20	Elmridge St.	8+46.57	Right	54	23	8.04	49.32	
I21	Elmridge St.	8+45.33	Left	54	23	8.42	49.45	
I22	Elmridge St.	9+09.85	Left	54	23	8.13	49.02	
I23	Elmridge St.	9+14.29	Right	54	23	8.96	48.96	
I24	Elmridge St.	9+74.85	Left	54	23	8.43	48.86	*
I25	Elmridge St.	10+10.70	Right	54	23	7.87	49.00	*
I26	Elmridge St.	10+40.16	Left	54	23	8.48	48.91	
I27	Elmridge St.	11+05.34	Left	55	23	8.16	48.56	*
I28	Elmridge St.	11+05.18	Right	55	23	8.47	48.70	
J1	Cloverdale St.	2+18.34	Left	56	36	16.2	49.76	
J2	Cloverdale St.	2+35.45	Right	56	32	15.93	49.71	*
J3	Cloverdale St.	2+77.97	Right	56	32	15.88	50.02	
J4	Cloverdale St.	2+75.51	Left	56	24	11.94	49.85	
J5	Cloverdale St.	2+93.62	Left	56	23	7.75	50.00	*
J6	Cloverdale St.	3+50.17	Left	56	23	8.79	49.75	
J7	Cloverdale St.	3+79.63	Right	56	24	9.9	49.73	
J8	Cloverdale St.	4+07.58	Left	56	23	7.9	49.67	
J9	Cloverdale St.	4+68.48	Left	57	23	7.67	49.51	
J10	Cloverdale St.	4+69.44	Right	57	23	9.09	49.04	
J11	Cloverdale St.	5+35.06	Left	57	23	7.76	49.69	
J12	Cloverdale St.	5+34.12	Right	57	23	9.09	49.03	
J13	Cloverdale St.	5+98.02	Left	57	23	8.37	49.12	
J14	Cloverdale St.	5+99.47	Right	57	23	8.91	49.14	
J15	Cloverdale St.	6+63.55	Left	57	23	7.78	49.22	
J16	Cloverdale St.	6+63.43	Right	57	23	8.3	48.96	
J17	Cloverdale St.	7+29.33	Left	57	23	7.8	49.35	
J18	Cloverdale St.	7+27.39	Right	57	23	8.06	49.22	
J19	Cloverdale St.	7+94.32	Left	57	23	8.81	49.59	*
J20	Cloverdale St.	7+93.93	Right	57	23	7.77	49.16	
J21	Cloverdale St.	8+68.71	Left	58	32	16.11	49.31	*
J22	Cloverdale St.	8+68.76	Right	58	24	11.7	49.13	*
K1	Linkmeadow Ln.	2+24.50	Left	59	28	14.31	49.04	
K2	Linkmeadow Ln.	2+36.38	Right	59	23	8.63	48.92	
K3	Linkmeadow Ln.	2+97.64	Left	59	22	8.02	49.28	
K4	Linkmeadow Ln.	3+06.60	Right	59	32	16.5	48.93	
K5	Linkmeadow Ln.	3+63.15	Left	59	22	8.05	48.78	
K6	Linkmeadow Ln.	3+71.19	Right	59	24	11.8	48.98	
K7	Linkmeadow Ln.	4+22.59	Left	59	23	8.74	48.77	
K8	Linkmeadow Ln.	4+39.84	Right	59	35	17.65	48.51	
K9	Linkmeadow Ln.	4+79.99	Left	59	22	7.95	48.40	
K10	Linkmeadow Ln.	5+12.84	Right	60	25	12.71	48.48	
K11	Linkmeadow Ln.	5+16.24	Left	60	29	14.75	48.60	
K12	Linkmeadow Ln.	5+89.35	Right	60	23	8.26	48.38	
K13	Linkmeadow Ln.	6+53.94	Right	60	24	9.73	48.37	
K14	Linkmeadow Ln.	7+18.98	Right	60	22	7.91	48.54	
K15	Linkmeadow Ln.	7+53.44	Left	60	31	16.11	48.45	
K16	Linkmeadow Ln.	7+87.84	Right	60	23	8.44	48.64	
K17	Linkmeadow Ln.	8+18.81	Right	60	47	24.76	48.48	

** THE URBAN FORESTER HAS VOICED CONCERN FOR TREE PROTECTION IN REGARDS TO THE PROPOSED WIDENING OF THESE DESIGNATED DRIVEWAYS TO CITY STANDARD MINIMUM WIDTH. THE CONTRACTOR SHALL COORDINATE WITH THE CITY WHO SHALL DETERMINE THE ULTIMATE WIDTH FOR CONSTRICTION OF THESE DRIVEWAYS.

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STATE OF TEXAS — JOHN D. RUDLOFF — 83386 — LICENSED PROFESSIONAL ENGINEER — 10/19/11

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 | Dwn By: F. Redburn
Date: May 2011 | Chkd By: D. Jorgensen

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Driveway Table

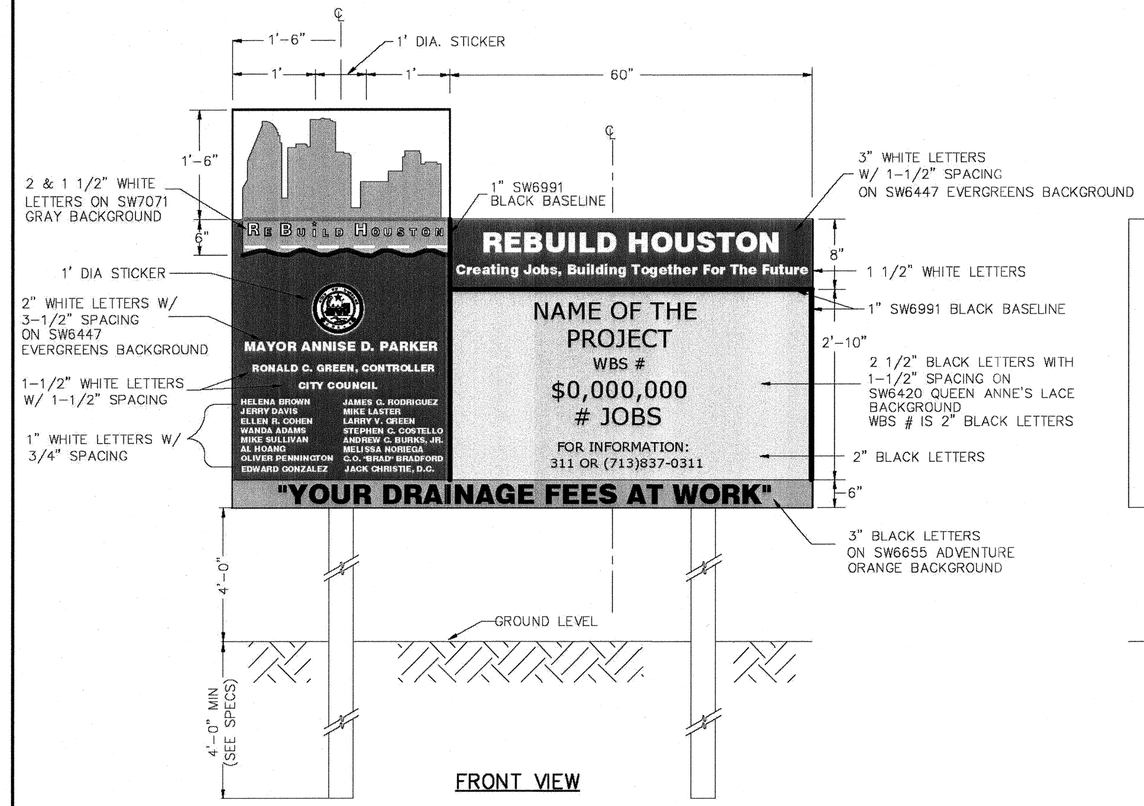
WBS NO.
N-000378-0002-4
DRAWING SCALE
VERT: HORZ:
CITY OF HOUSTON PM
MARK BOARD, P.E.

SHEET No: 121 OF 122

FOR CITY OF HOUSTON USE ONLY

PUBLIC WORKS AND ENGINEERING — REVIEWED AND FILED — 48978 — NUMBER — TEXAS

NB



COH

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

CONSTRUCTION SIGN
ReBuild Houston Project
Drainage Utility Fee Funding
(NOT TO SCALE)

APPROVED: CITY ENGINEER

APPROVED: DIRECTOR OF PUBLIC WORKS AND ENGINEERING

EFF DATE JAN-25-2012 DWG NO: 01580-04

1 UPDATE PROJECT SIGN DWG.# 01580.4 01/12 AS DJ

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STATE OF TEXAS
HARRY BRIAN WALKER
83225
REGISTERED PROFESSIONAL ENGINEER

SURVEYED BY:
Landtech Consultants, Inc.
FB NO. PB#5543

Job No.: 09-051 | Dwn By: A. Shaw
Date: May 2011 | Chkd By: D. Jorgensen

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

City of Houston
Neighborhood Street Reconstruction
Project NSR 446A

Project Sign Detail

WBS NO.	FOR CITY OF HOUSTON USE ONLY
N-000378-0002-4	PUBLIC WORKS AND ENGINEERING — REVIEWED AND FILED — 48978 — NUMBER — TEXAS
DRAWING SCALE	
VERT: NA HORZ: NA	
CITY OF HOUSTON PM	
MARK BOARD, P.E.	

SHEET No: 122 OF 122