

GENERAL NOTES:

1.

THE UTILITIES SHOWN HEREIN WERE PLOTTED FROM AVAILABLE INFORMATION AND DO NOT NECESSARILY REFLECT THE ACTUAL EXISTENCE, NON-EXISTENCE, SIZE, TYPE, OR LOCATION OF THESE OR OTHER UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE ACTUAL LOCATION OF ALL UTILITIES, SHOWN OR NOT SHOWN, AND SAID UTILITIES SHALL BE LOCATED IN THE FIELD PRIOR TO ANY CONSTRUCTION OF IMPROVEMENTS. THESE PROVISIONS SHALL IN NO WAY ABSOLVE ANY PARTY FROM COMPLYING WITH THE UNDERGROUND FACILITY SAFETY AND DAMAGE PREVENTION ACT, CHAPTER 319 RSMO.
1.

ALL ELEVATIONS ARE BASED ON U.S.G.S. DATUM.
2.

BOUNDARY AND TOPOGRAPHIC SURVEY PROVIDED BY CHECKPOINT SURVEYING LLC.
3.

ALL MATERIALS AND METHODS OF CONSTRUCTION TO MEET THE CURRENT STANDARDS AND SPECIFICATIONS OF ST. LOUIS CITY.
4.

ALL GRADED AREAS SHALL BE PROTECTED FROM EROSION BY EROSION CONTROL DEVICES AND/OR SEEDING AND MULCHING AS REQUIRED BY ST. LOUIS CITY & MISSOURI DNR.
5.

PRIOR TO BEGINNING ANY WORK ON THE SITE, THE DEVELOPER SHALL HAVE A PRECONSTRUCTION CONFERENCE WITH ST. LOUIS CITY PRIOR TO ANY CLEARING, GRADING, OR INSTALLATION OF IMPROVEMENTS.
6.

GRADING CONTRACTOR SHALL INSTALL SILTATION CONTROL PRIOR TO STARTING THE GRADING. ADDITIONAL SILTATION CONTROL DEVICES SHALL BE INSTALLED PER ST. LOUIS CITY STANDARDS.
7.

ALL FILLS AND BACKFILLS SHALL BE MADE OF SELECTED EARTH MATERIALS, FREE FROM BROKEN MASONRY, ROCK, FROZEN EARTH, RUBBISH, ORGANIC MATERIAL AND DEBRIS.
8.

GRADING CONTRACTOR SHALL KEEP EXISTING ROADWAYS CLEAN OF MUD AND DEBRIS AT ALL TIMES.
9.

PROPOSED CONTOURS SHOWN ARE FINISHED ELEVATIONS ON PAVED AREAS.
10.

NO GRADE SHALL EXCEED 3:1 SLOPE.
11.

A GRADING PERMIT IS REQUIRED PRIOR TO ANY GRADING ON THE SITE. NO CHANGE IN WATERSHEDS SHALL BE PERMITTED.
12.

INTERIM STORMWATER DRAINAGE CONTROL IN THE FORM OF SILTATION CONTROL MEASURES ARE REQUIRED.
13.

THE DEVELOPER IS REQUIRED TO PROVIDE ADEQUATE STORMWATER SYSTEMS IN ACCORDANCE WITH ST. LOUIS CITY STANDARDS.
14.

ALL STORMWATER SHALL BE DISCHARGED AT AN ADEQUATE NATURAL DISCHARGE POINT.
15.

ADEQUATE TEMPORARY OFF-STREET PARKING SHALL BE PROVIDED FOR CONSTRUCTION EMPLOYEES. PARKING ON NON-SURFACED AREAS SHALL BE PROHIBITED IN ORDER TO ELIMINATE THE CONDITION WHEREBY MUD FROM CONSTRUCTION AND EMPLOYEE VEHICLES IS TRACKED ONTO THE PAVEMENT CAUSING HAZARDOUS ROADWAY AND DRIVING CONDITIONS.
16.

THE DEVELOPER IS ADVISED THAT UTILITY COMPANIES WILL REQUIRE COMPENSATION FOR RELOCATION OF THEIR UTILITY FACILITIES WITHIN PUBLIC ROAD RIGHT-OF-WAY. UTILITY RELOCATION COST SHALL BE CONSIDERED THE DEVELOPER'S RESPONSIBILITY. THE DEVELOPER SHOULD ALSO BE AWARE OF EXTENSIVE DELAYS IN UTILITY COMPANY RELOCATION AND ADJUSTMENTS. SUCH DELAYS WILL NOT CONSTITUTE A CAUSE TO OCCUPANCY PRIOR TO COMPLETION OF ROAD IMPROVEMENTS.
17.

THE OWNER SHALL, AT ALL TIMES, CONTAIN MUD AND OTHER SPOILS ON THIS SITE. NO VEHICLE, TRAILER OR CONSTRUCTION EQUIPMENT IS TO DEPOSIT MUD OR ANY OTHER MATERIAL ON PUBLIC STREETS. PROJECT WILL BE STOPPED IF STREETS ARE NOT CLEANED IMMEDIATELY.
18.

THE CONTRACTOR SHALL FURNISH, MAINTAIN, AND REMOVE TRAFFIC CONTROL DEVICES FOR THE PURPOSE OF REGULATING, WARNING, AND DIRECTING TRAFFIC DURING ALL PHASES OF CONSTRUCTION. ALL FLAGMEN, BARRICADES, WARNING SIGNS, ETC. SHALL CONFORM TO THE MANUAL FOR UNIFORM TRAFFIC CONTROL DEVICES.

LEGEND:

- UTILITY POLE
- FIRE HYDRANT
- GAS VALVE
- SANITARY SEWER
- STORM SEWER
- GAS LINE
- WATER LINE
- OVERHEAD ELECTRIC LINE
- EXISTING CONTOURS
- PROPOSED CONTOURS
- PROPOSED SANITARY SEWERS
- PROPOSED STORM SEWERS
- PROPOSED LIGHT STANDARD

SITE DATA:

OWNER NAME:

SKINKER-DEBALIVIERE
COM HOUSING CORP
6008 KINGSBURY,
ST. LOUIS, MO 63112

PARCEL NUMBER:

54230001400

FIRM PANEL NUMBER:

2903850050C

SITE AREA:

9,934 S.F. OR 0.23 AC.

EXISTING ZONING:

B (TWO FAMILY RESIDENTIAL)

PROPOSED USES:

RESIDENTIAL TOWNHOUSES

ABBREVIATIONS:

- N/F

W

DB.

PB.

CONC.

SAN.

MH

R

L

D

TBR

TBR&R

UIP

D.S.
- NOW OR FORMERLY

WIDE

DEED BOOK

PLAT BOOK

CONCRETE

SANITARY

MANHOLE

RADIUS

LENGTH

DELTA

TO BE REMOVED

TO BE REMOVED AND REPLACED

TO BE USED IN PLACE

ROOF DOWNSPOUT

BENCHMARK/SITE BENCHMARK:

MODOT ESTABLISHED (VRS NETWORK) NAVD88 ELEVATION = 498.89'
SET MAG NAIL IN ASPHALT PAVEMENT 73.377 FEET NORTH AND 13.61 FEET EAST OF NORTHEAST PROPERTY CORNER FOUND PIPE WITH CAP.

PUBLIC SEWER MAINTENANCE:

MAINTENANCE OF THE SEWERS DESIGNATED "PUBLIC" SHALL BE THE RESPONSIBILITY OF THE METROPOLITAN ST. LOUIS SEWER DISTRICT UPON DEDICATION OF THE SEWERS TO THE DISTRICT.

CONTRACTOR'S INSURANCE (OFFSITE):

PRIOR TO OBTAINING A CONSTRUCTION PERMIT FROM THE METROPOLITAN ST. LOUIS SEWER DISTRICT, THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE THE DISTRICT WITH A COPY OF AN EXECUTED CERTIFICATE OF INSURANCE INDICATING THAT THE PERMITTEE HAS OBTAINED AND WILL CONTINUE TO CARRY COMMERCIAL GENERAL LIABILITY AND COMPREHENSIVE AUTO LIABILITY INSURANCE. THE REQUIREMENTS AND LIMITS SHALL BE AS STATED IN THE RULES AND REGULATIONS AND ENGINEERING DESIGN REQUIREMENTS FOR SANITARY AND STORMWATER DRAINAGE FACILITIES, SECTION 10.090 (ADDENDUM).

SHOP DRAWING REVIEW NOTE:

THE PROJECT ENGINEER SHALL PROVIDE SHOP DRAWINGS SIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN MISSOURI FOR APPROVAL TO MSD PRIOR TO CONSTRUCTION OF THESE STRUCTURES. STRUCTURES SHALL BE DESIGNED TO SUSTAIN HS-20 LOADS. PLEASE CONTACT THE DISTRICT'S CONSTRUCTION MANAGEMENT DIVISION AT (314) 355-2072 FOR QUESTIONS.

REMEDiate SOIL PRIOR TO CONSTRUCTION NOTE:

AT THE COMPLETION OF SWPPP ACTIVITIES AND PRIOR TO BMP CONSTRUCTION: REMOVE ALL CONSTRUCTION SEDIMENT, 1' OF ADDITIONAL NATIVE SOIL BELOW SEDIMENT, AND THEN TILL/RIP SUB GRADE 6-12 INCHES DEEP.

INFILTRATION BED:

TO PREVENT CONSTRUCTION SEDIMENT FROM CLOGGING INFILTRATION BED, AT NO TIME MAY CONSTRUCTION SEDIMENT ENTER THESE FACILITIES. ADDITIONALLY, THESE FACILITIES SHALL NOT BE CONSTRUCTED UNTIL ALL SURROUNDING AREA THAT DRAINS TO THEM IS FULLY STABLE/ESTABLISHED.

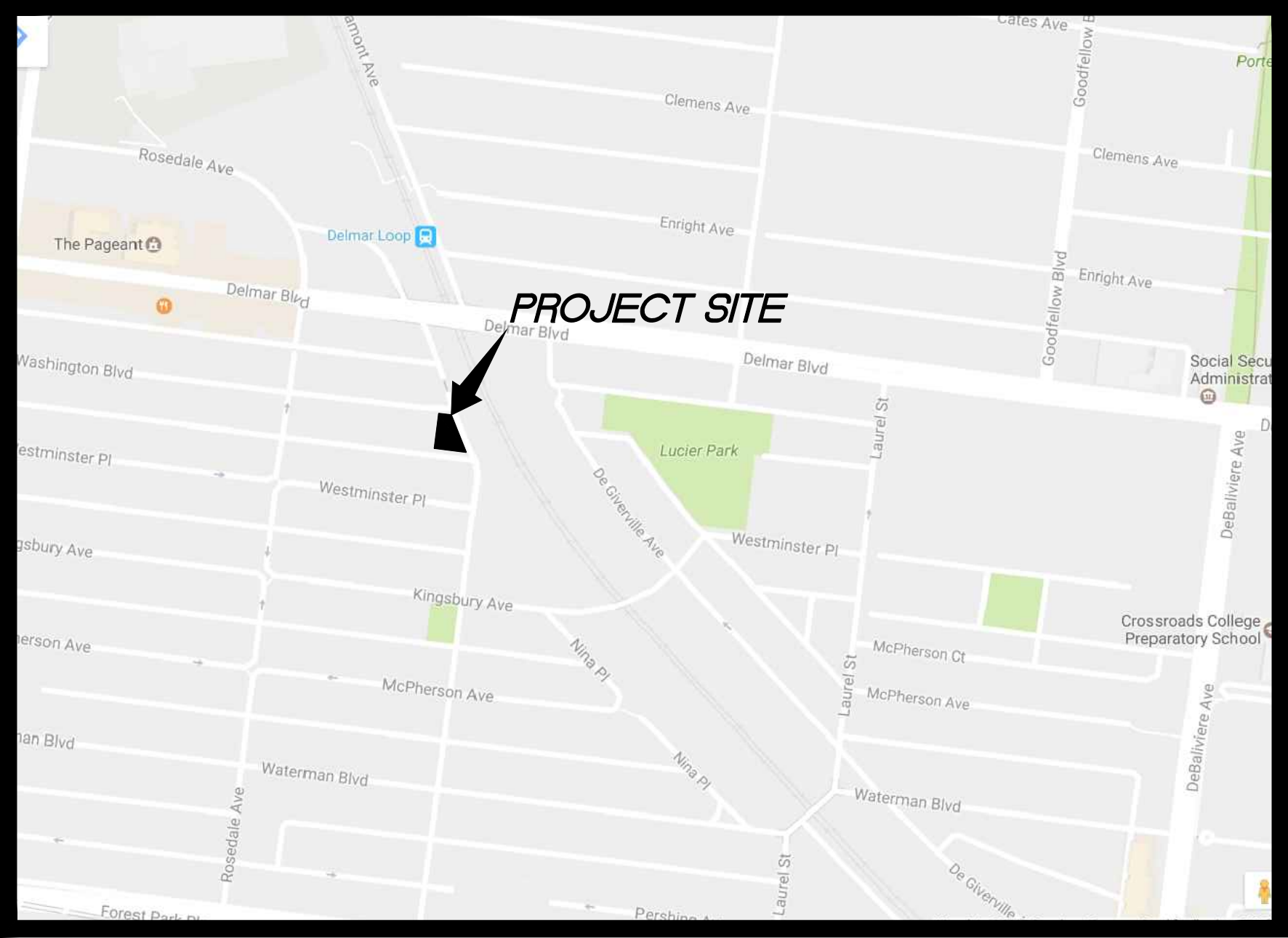
FUTURE DISTURBANCE NOTE (1) FOR PROJECTS THAT PROPOSE A BMP AND / OR DETENTION:

STORMWATER MANAGEMENT NOTE:

LAND AREA DISTURBED = 0.23 ACRES
CONTRACTOR SHALL STAY WITHIN THE LIMITS OF DISTURBANCE AS SHOWN ON THE PLANS AND MINIMIZE DISTURBANCE WITHIN THE WORK AREA WHENEVER POSSIBLE.

ANY FUTURE LAND DISTURBANCE, INCREASE IN IMPERVIOUS AREA, AND/OR CHANGE IN RUNOFF CONDITIONS ON THIS SITE MAY REQUIRE ADDITIONAL STORM WATER MANAGEMENT PER MSD REGULATIONS

WALKER TOWNHOMES
SITE DEVELOPMENT PLAN
LOT 15 IN BLOCK 9 OF WASHINGTON HEIGHTS
AND IN BLOCK 5423 OF THE CITY OF
ST. LOUIS, MISSOURI



LOCATION MAP

SERVICE DISTRICTS:

- FIRE:

ST. LOUIS FIRE DEPARTMENT
1421 JEFFERSON AVENUE
ST. LOUIS, MO 63106
314.289.1900
- GAS:

LACLEDE GAS COMPANY
700 MARKET STREET
ST. LOUIS, MO 63101
314.621.6960
- AMBULANCE:

ABBOTT AMBULANCE INC
2500 ABBOTT PLACE
ST. LOUIS, MO 63143
(314) 768-1212
- ELECTRIC:

AMEREN UE
PO BOX 790352
ST. LOUIS, MO 63179
877.263.7361
- SCHOOL:

ST. LOUIS PUBLIC SCHOOL DISTRICT
801 NORTH 11TH ST
ST. LOUIS, MO 63101
314-231-3720
- TELEPHONE:

CHARTER COMMUNICATIONS
1155 ST. LOUIS GALLERIA
ST. LOUIS, MISSOURI 63105
314.282.9655
- SEWER:

METROPOLITAN ST. LOUIS SEWER DISTRICT
2350 MARKET STREET
ST. LOUIS, MO 63103
314.768.6260
- POST OFFICE:

U.S. POST OFFICE
1409 HAMILTON AVE
ST. LOUIS, MO 63112
314.385.8977
- WATER:

CITY OF ST. LOUIS WATER DIVISION
4600 MCCREE AVE
ST. LOUIS, MO 63110
314.633.9000
- CABLE TV:

CHARTER COMMUNICATIONS
1155 ST. LOUIS GALLERIA
ST. LOUIS, MISSOURI 63105
314.282.9655

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DRAWING INDEX

C1	TITLE SHEET
C2	DEMOLITION PLAN
C3	SITE PLAN
C4	GRADING PLAN
C5	UTILITY PLAN/SANITARY PROFILE
C6	DRAINAGE AREA PLAN
C7	CONSTRUCTION DETAILS

MSD NOTES:

STANDARD CONSTRUCTION

ALL STORM AND SANITARY SEWER STRUCTURES AND APPURTENANCES TO BE DEDICATED TO MSD, OR TO BE PRIVATE UNDER MSD INSPECTION, SHALL CONFORM TO THE METROPOLITAN ST. LOUIS SEWER DISTRICT, STANDARD CONSTRUCTION SPECIFICATIONS FOR SEWERS AND DRAINAGE FACILITIES, 2009. THAT WILL INCLUDE STANDARD DETAILS SHOWN THEREIN, AND SHALL INCLUDE ALL SUBSEQUENT CHANGES MADE THERETO.

SOME RECENT CHANGES CONCERN PIPE FIELD TESTING AND PERFORMANCE, AND INCLUDE THE FOLLOWING:

PART 4 -PIPE SEWER CONSTRUCTION

SECTION B, PIPE FIELD TESTS, PARAGRAPH 2, REACH INTEGRITY TESTING -DELETE THE FIRST SENTENCE AND THE FOLLOWING REPLACEMENT APPLIES:

ALL SANITARY AND COMBINED SEWERS SHALL SUSTAIN A MAXIMUM LEAKAGE LIMIT OF 100 GALLONS/INCH OF PIPE DIAMETER/MILE OF LINE/DAY, AS REQUIRED BY THE MISSOURI DEPARTMENT OF NATURAL RESOURCES SPECIFICATIONS.

SECTION B, PIPE FIELD TESTS, PARAGRAPH 2, REACH INTEGRITY TESTING, SUBPARAGRAPH C, INFILTRATION/EXFILTRATION TESTING -DELETE THE SIXTH SENTENCE, CONCERNING LEAKAGE LIMITS, AND THE FOLLOWING REPLACEMENT APPLIES:

THE MEASUREMENT OF LEAKAGE SHALL NOT EXCEED 100 GALLONS/INCH OF PIPE DIAMETER/MILE OF LINE/DAY, AS REQUIRED BY THE MISSOURI DEPARTMENT OF NATURAL RESOURCES SPECIFICATIONS.

SECTION B, PIPE FIELD TESTS, PARAGRAPH 4, MANHOLE TESTING, SUBPARAGRAPH A, VACUUM TESTING -AFTER THE FIRST SENTENCE, THE FOLLOWING ADDITION APPLIES:

THE VACUUM TEST MUST BE PERFORMED PRIOR TO BACKFILLING AROUND THE MANHOLE UNLESS THE CONTRACTOR PROVIDES DOCUMENTATION FROM THE PRECAST MANHOLE MANUFACTURER STATING THAT THE MANHOLE MAY BE VACUUM TESTED AFTER BACKFILLING HAS TAKEN PLACE. THE CONTRACTOR MUST SUBMIT THIS DOCUMENTATION PRIOR TO BACKFILLING AROUND ANY MANHOLE.

SECTION B, PIPE FIELD TESTS, PARAGRAPH 4, MANHOLE TESTING, SUBPARAGRAPH B, EXFILTRATION TESTING - DELETE THE SECOND SENTENCE, CONCERNING LEAKAGE LIMITS, AND THE FOLLOWING ADDITION APPLIES:

FOR EXFILTRATION TESTING, THE ALLOWABLE LEAKAGE LIMIT IS 100 GALLONS/INCH OF PIPE DIAMETER/MILE OF LINE/DAY WHEN THE AVERAGE HEAD ON THE TEST SECTION IS THREE FEET (3') OR LESS.

SEPTIC TANK ABANDONMENT:

SEPTIC TANKS SHALL BE ABANDONED IN ACCORDANCE WITH THE METROPOLITAN ST. LOUIS SEWER DISTRICT STANDARD CONSTRUCTION SPECIFICATIONS FOR SEWER AND DRAINAGE FACILITIES, 2009.



CALL BEFORE
YOU DIG!
1-800-DIG-RITE

IN PLACE AT THAT TIME (INCLUDING TOTAL LAND DISTURBANCE AND/OR IMPERVIOUSNESS ADDED ON THIS PLAN).

BACKFILL (TRENCH, ETC.):

ALL FILLED AREAS, INCLUDING TRENCH BACKFILLS, UNDER BUILDINGS, PROPOSED STORM AND SANITARY SEWER LINES, AND PAVED AREAS SHALL BE COMPACTED TO A MINIMUM OF 90 PERCENT OF "MODIFIED PROCTOR." FILL IS TO BE PLACED IN A MAXIMUM OF 9-INCH LIFTS. TESTS SHALL BE TAKEN AT A MAXIMUM OF 50-FOOT INTERVALS ALONG THE ROUTE OF THE PIPE; AT A MAXIMUM OF 2-FOOT VERTICALLY; AND LATERALLY ON EACH SIDE OF THE PIPE, AT A DISTANCE EQUAL TO THE DEPTH OF FILL OVER THE PIPE. A COPY OF THESE RESULTS WILL BE SUBMITTED TO MSD PRIOR TO CONSTRUCTION APPROVAL.

BACKWATER VALVE NOTE:

A BACKWATER VALVE MAY BE REQUIRED ON ALL BUILDING LATERALS PER LOCAL BUILDING CODE.

COMPACTED FILL REQUIREMENTS:

A REGISTERED PROFESSIONAL GEOTECHNICAL ENGINEER WILL VERIFY THAT ALL COMPRESSIBLE MATERIAL HAS BEEN REMOVED PRIOR TO FILL PLACEMENT AND THAT ALL FILL, AND FILLED AREAS, INCLUDING TRENCH BACKFILLS, UNDER BUILDINGS AND UNDER SANITARY AND STORM SEWER LINES CONSTRUCTED ABOVE THE ORIGINAL GROUND SURFACE, HAS BEEN COMPACTED TO 90% MODIFIED PROCTOR. FILL IS TO BE PLACED IN A MAXIMUM OF 9-INCH LIFTS. TESTS SHALL BE TAKEN AT A MAXIMUM OF 50-FOOT INTERVALS ALONG THE ROUTE OF THE PIPE, AT A MAXIMUM OF 2-FOOT VERTICALLY AND LATERALLY ON EACH SIDE OF THE PIPE, AT A DISTANCE EQUAL TO THE DEPTH OF FILL OVER THE PIPE. A COPY OF THESE RESULTS WILL BE SUBMITTED TO MSD PRIOR TO PLACEMENT OF THE SEWER PIPE.

CONTRACTOR'S INSURANCE (OFFSITE):

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SANITARY LATERALS (2%):

LATERALS TO BE 6-INCH PVC AND CONSTRUCTED AT 2.0% MINIMUM SLOPE.

CITY DATUM:

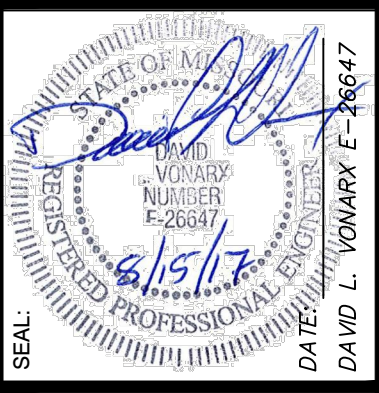
TO CONVERT FROM CITY OF ST. LOUIS DATUM TO U.S.G.S. DATUM, ADD 413.69 FEET TO THE CITY OF ST. LOUIS DATUM.

MSD BASE MAP - 18H3
MSD P-31231-00
ZIP CODE 63134
CITY BLOCK 5423

TITLE SHEET

Date	Revisions						
	REVISED PER MSD COMMENTS	REVISED PER MSD COMMENTS					
06/23/2017							
08/15/2017							

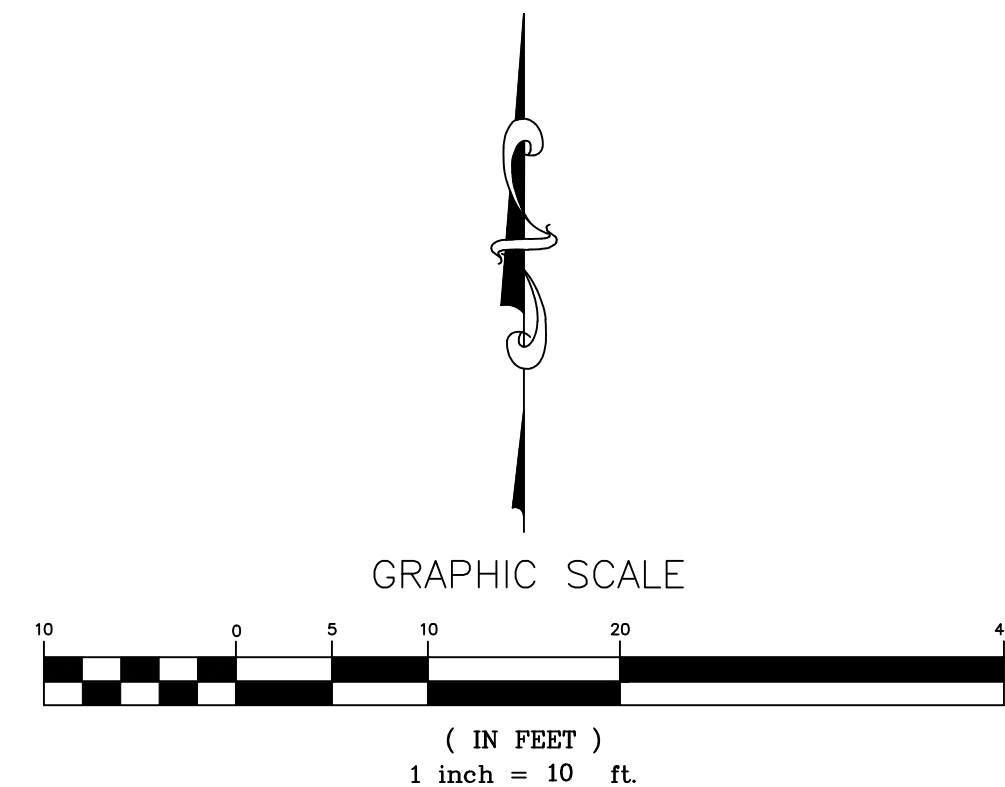
WALKER TOWNHOMES
521 DES PERES AVENUE
ST. LOUIS, MO 63112



VonArx
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10746 BUSINESS 01, SUITE A
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dvonara@vonarxengineering.com
CERTIFICATE OF AUTHORITY 0975

SKINKER DEBALIVIERE COMMUNITY
HOUSING CORPORATION
6008 KINGSBURY AVENUE
ST. LOUIS, MO 63112

ISSUE DATE
05/17/2017
SCALE
NOTED
Job Number
14857
Sheet Number
C1

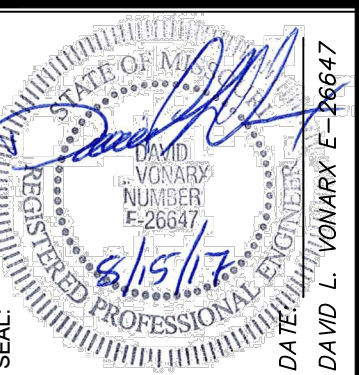


- A. EXISTING TREE TO BE REMOVED.
- B. EXISTING CURB TO BE REMOVED. (9' L.F.±)
- C. EXISTING CURB AND GUTTER TO BE REMOVED. (7 L.F.±)
- D. EXISTING ASPHALT PAVEMENT TO BE REMOVED. (167' S.F.±)
- E. EXISTING SIDEWALK TO BE REMOVED. (70' S.F.±)
- F. EXISTING SANITARY MANHOLE TO BE EVALUATED BY MSD FIELD INSPECTOR. TO REMAIN, BE REHABILITATED, OR TO BE REMOVED AND REPLACED AT THE DISCRETION OF THE MSD FIELD INSPECTOR.
- G. NEW SAWCUT LINE.

DEMOLITION PLAN

Date	Revisions
06/23/2017	REVISED PER MSD COMMENTS
08/15/2017	REVISED PER MSD COMMENTS

WALKER TOWNHOMES
521 DES PERES AVENUE
ST. LOUIS, MO 63112



VonArx
Engineering

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10785 BUSINESS 21, SUITE A
HILLSBORO, MISSOURI 63050
dvonarx@vonarxengineering.com
CERTIFICATE OF AUTHORITY 0975

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HOUSING CORPORATION
6008 KINGSBURY AVENUE
ST. LOUIS, MO 63112

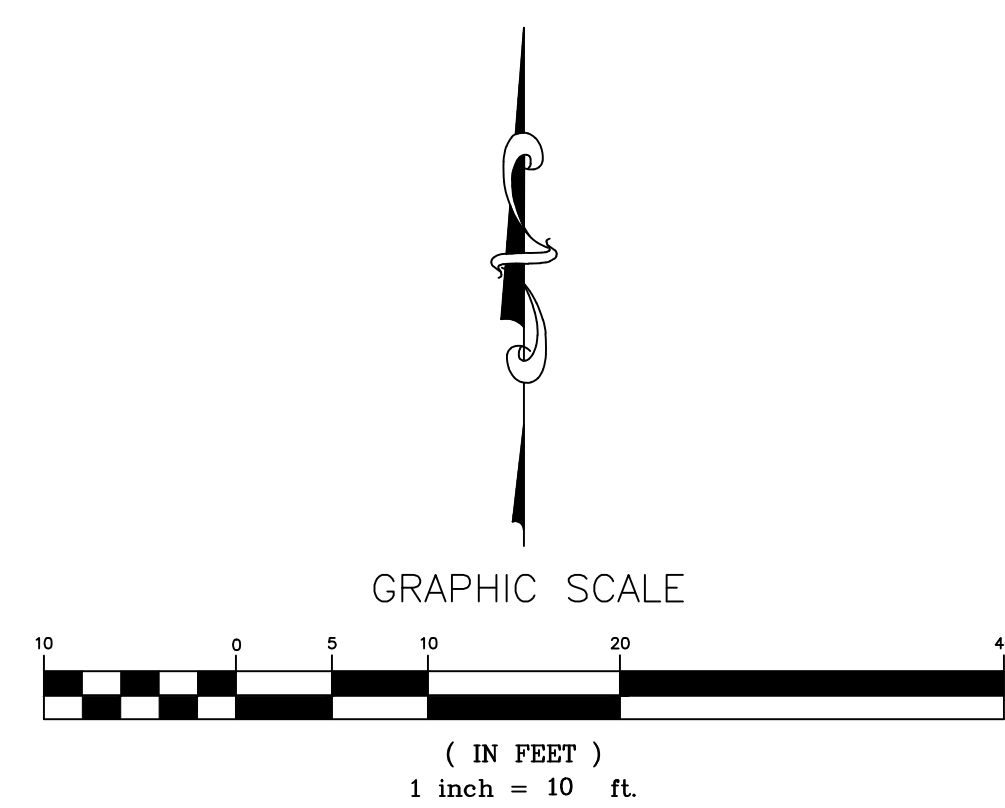
ISSUE DATE
05/17/2017

SCALE
1" = 10'

Job Number
14857

Sheet Number

C2



A. PROPOSED BUILDING. REFER TO ARCHITECTURAL PLANS FOR DETAILS.
B. PROPOSED CONCRETE CURB. REFER TO SHEET C7 FOR DETAILS.
C. PROPOSED FENCE. REFER TO SHEET C7 FOR DETAILS.
D. PROPOSED CONCRETE SIDEWALK. REFER TO SHEET C7 FOR DETAILS.
E. PROPOSED CONCRETE PAVEMENT. REFER TO SHEET C7 FOR DETAILS.
F. PROPOSED CONCRETE STAIRS. REFER TO ARCHITECTURAL PLANS FOR DETAILS.

NOTES:

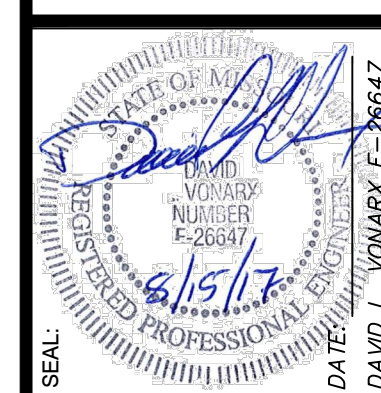
1. IT APPEARS THAT THE SANITARY AND STORM LINES MAY BE PLACED IN THE SAME TRENCH. IF STORM AND SANITARY SEWERS ARE PARALLEL AND IN THE SAME TRENCH, THE UPPER PIPE SHALL BE PLACED ON A SHELF AND THE LOWER PIPE SHALL BE BEDDED IN COMPACTED GRANULAR FILL TO THE FLOW LINE OF THE UPPER PIPE.

MSD BASE MAP - 18H3
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CITY BLOCK 5423

SITE PLAN

Date	Revisions
06/23/2017	REVISED PER MSD COMMENTS
08/15/2017	REVISED PER MSD COMMENTS

WALKER TOWNHOMES
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ST. LOUIS, MO 63112



ENGINEER

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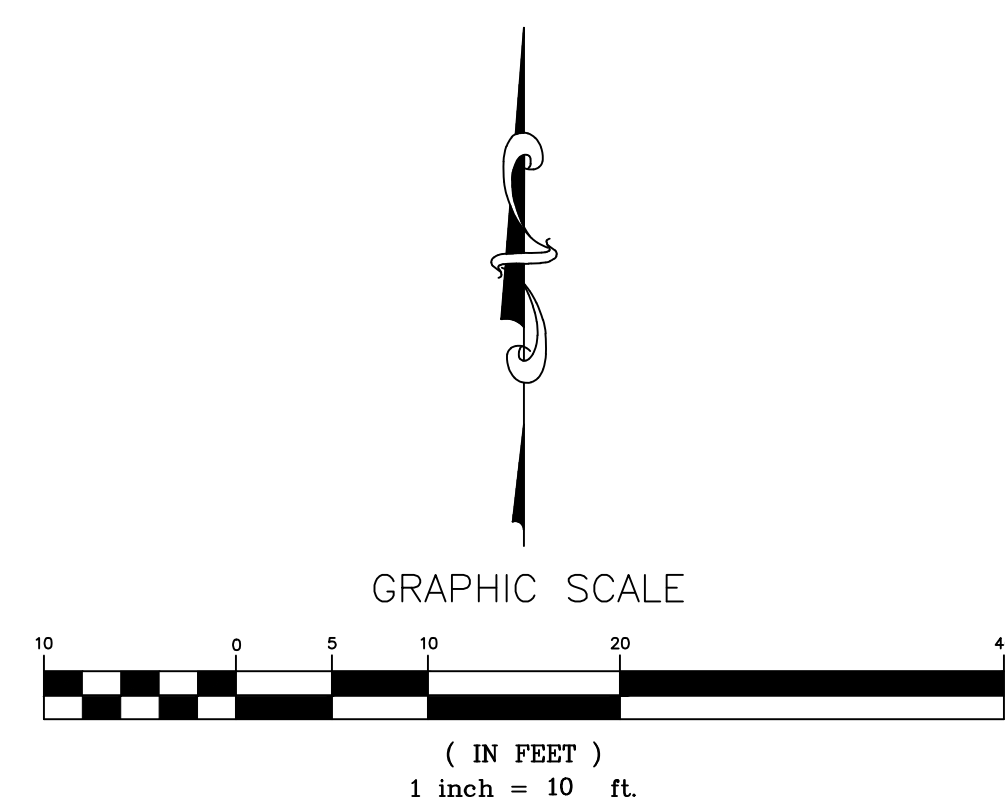
ISSUE DATE
05/17/2017


SCALE
1" = 10'

Job Number
14857

Sheet Number

C3

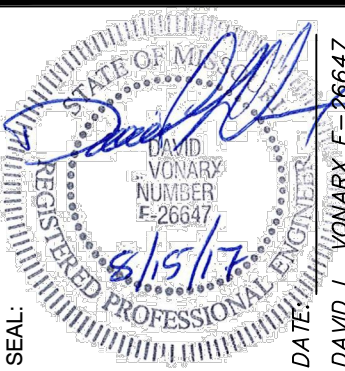



KEYED NOTES: 

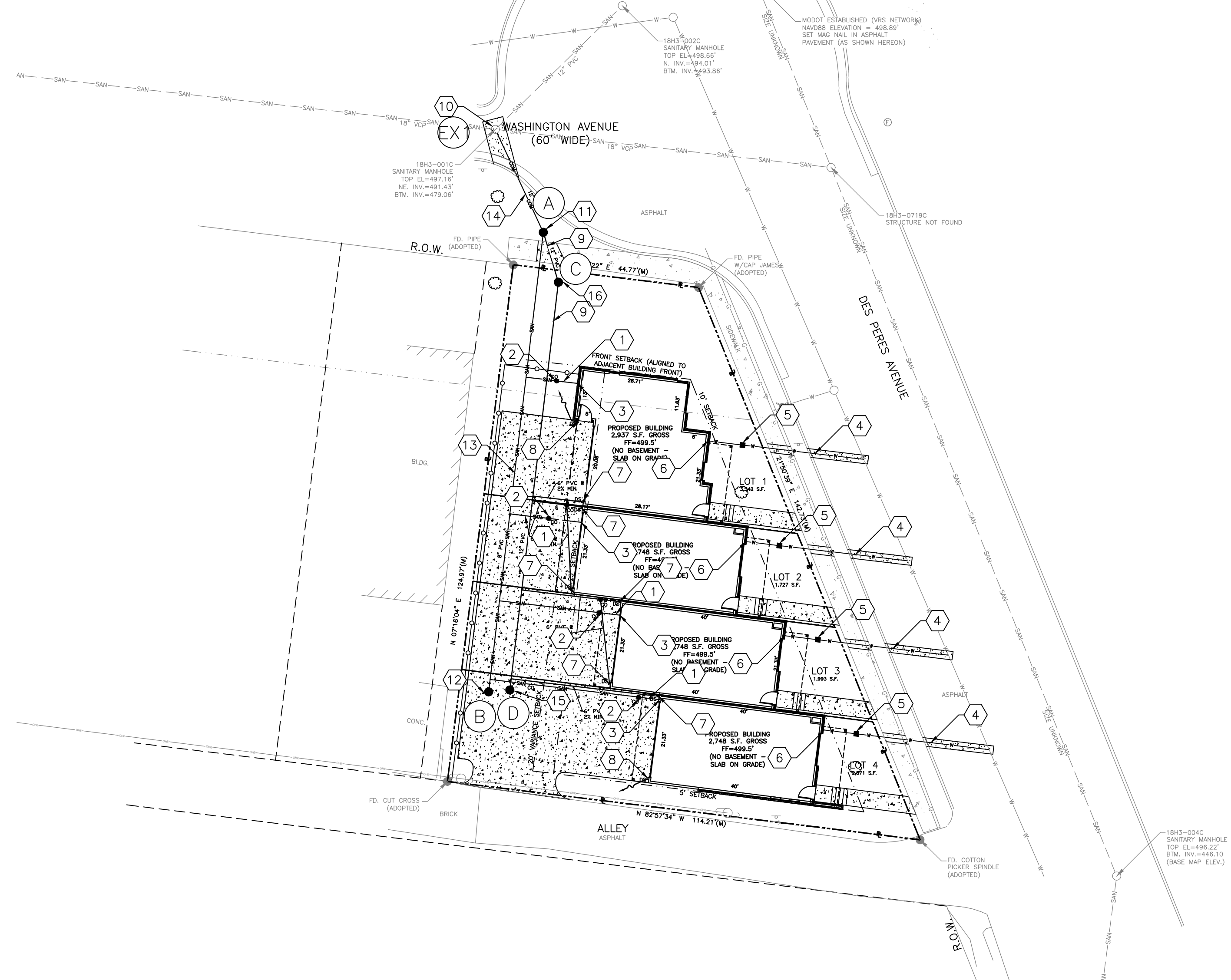
- A. REPLACE ASPHALT TO EXISTING GRADES.
- B. REPLACE CURB TO EXISTING GRADES.
- C. REPLACE CURB AND GUTTER TO EXISTING GRADES.
- D. REPLACE SIDEWALK TO EXISTING GRADES.

MSD BASE MAP - 18H3
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GRADING PLAN

Revisions	
Date	Revised Per MSD Comments
06/23/2017	08/15/2017
WALKER TOWNHOMES 521 DES PERES AVENUE ST. LOUIS, MO 63112	
	
 OFFICE: (636) 797-4425 10746 BUSINESS 21, SUITE A HILLTOP, MISSOURI 63126 vonarx@vonarxengineering.com CERTIFICATE OF AUTHORITY 0975	
SKINKER DEBALMIERE COMMUNITY HOUSING CORPORATION 6008 KINGSBURY AVENUE ST. LOUIS, MO 63112	
ISSUE DATE 05/17/2017	
SCALE 1"=10'	
Job Number 14857	
Sheet Number C4	

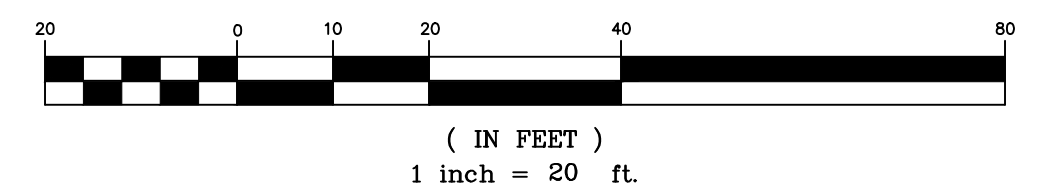
- NOTES:
1. THE REMOVAL AND REPLACEMENT, OR REHABILITATION OF THE EXISTING STRUCTURES WILL BE DETERMINED BY THE MSD FIELD INSPECTOR. IF THE STRUCTURE IS DETERMINED TO REMAIN IN PLACE, THEN THE TOP SHALL BE ADJUSTED TO GRADE (IF NEEDED).
 2. COM = COMBINED SANITARY AND STORM SEWER.
 3. PROVIDE A CONCRETE CRADLE AT COMBINED SANITARY AND STORM SEWER AT 21.4% SLOPE. SEE SHEET C7 FOR DETAIL.
 4. IT APPEARS THAT THE SANITARY AND STORM LINES MAY BE PLACED IN THE SAME TRENCH. IF STORM AND SANITARY SEWERS ARE PARALLEL AND IN THE SAME TRENCH, THE UPPER PIPE SHALL BE PLACED ON A SHELF AND THE LOWER PIPE SHALL BE BEDDED IN COMPACTED GRANULAR FILL TO THE FLOW LINE OF THE UPPER PIPE.



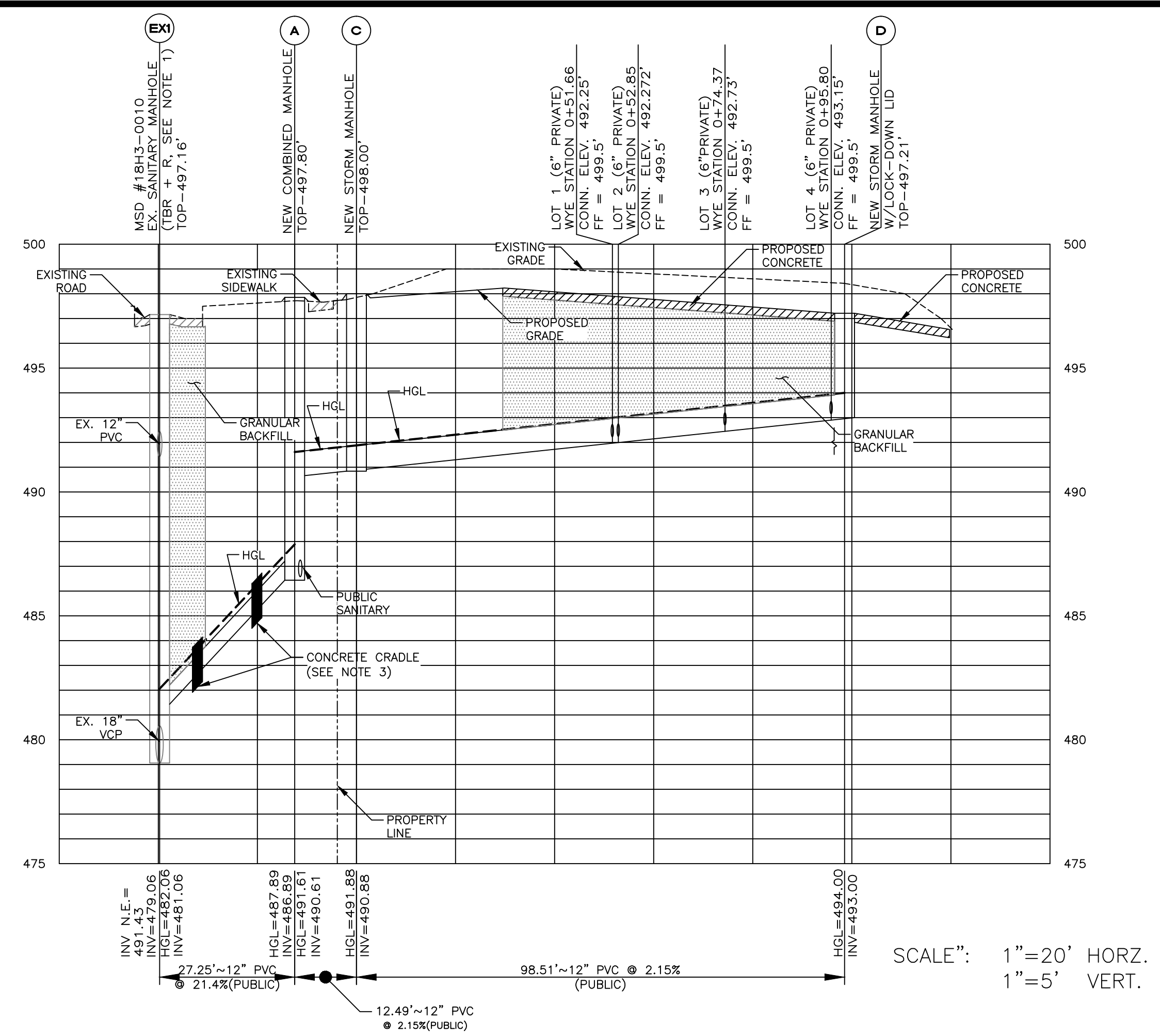
KEYED NOTES:

1. NEW 6" PRIVATE SANITARY LATERAL MINIMUM 2% SLOPE.
2. NEW SANITARY CLEANOUT. REFER TO SHEET C7 FOR DETAILS.
3. NEW SANITARY POINT OF CONNECTION.
4. NEW 1" WATER LINE.
5. NEW WATER METER.
6. NEW WATER POINT OF CONNECTION.
7. NEW 6" DOWNSPOUT PIPED WITH CLEANOUTS TO COMBINED PUBLIC SEWER.
8. NEW 6" DOWNSPOUT DISCHARGED AT GRASS. GRADE TO DRAIN AWAY FROM BUILDINGS.
9. NEW 12" PUBLIC STORMWATER PIPE CONNECTING INTO COMBINED PUBLIC SEWER.
10. EXISTING MANHOLE #18H3-0010 TO BE EVALUATED BY MSD FIELD INSPECTOR. TO REMAIN, TO BE REMOVED AND REPLACED, OR TO BE REHABILITATED AT THE DISCRETION OF THE MSD FIELD INSPECTOR.
11. NEW PUBLIC SANITARY MSD APPROVED FLOW THROUGH MANHOLE INSIDE ROW.
12. NEW PUBLIC SANITARY MANHOLE WITH A LOCK-LID.
13. NEW 8" PUBLIC SANITARY SEWER.
14. NEW 12" COMBINED SEWER PIPE CONNECTING INTO EXISTING COMBINED PUBLIC SEWER MANHOLE #18H3-0010.
15. NEW PUBLIC STORMWATER TERMINAL MANHOLE WITH A LOCK-LID.
16. NEW PUBLIC STORMWATER SEWER.

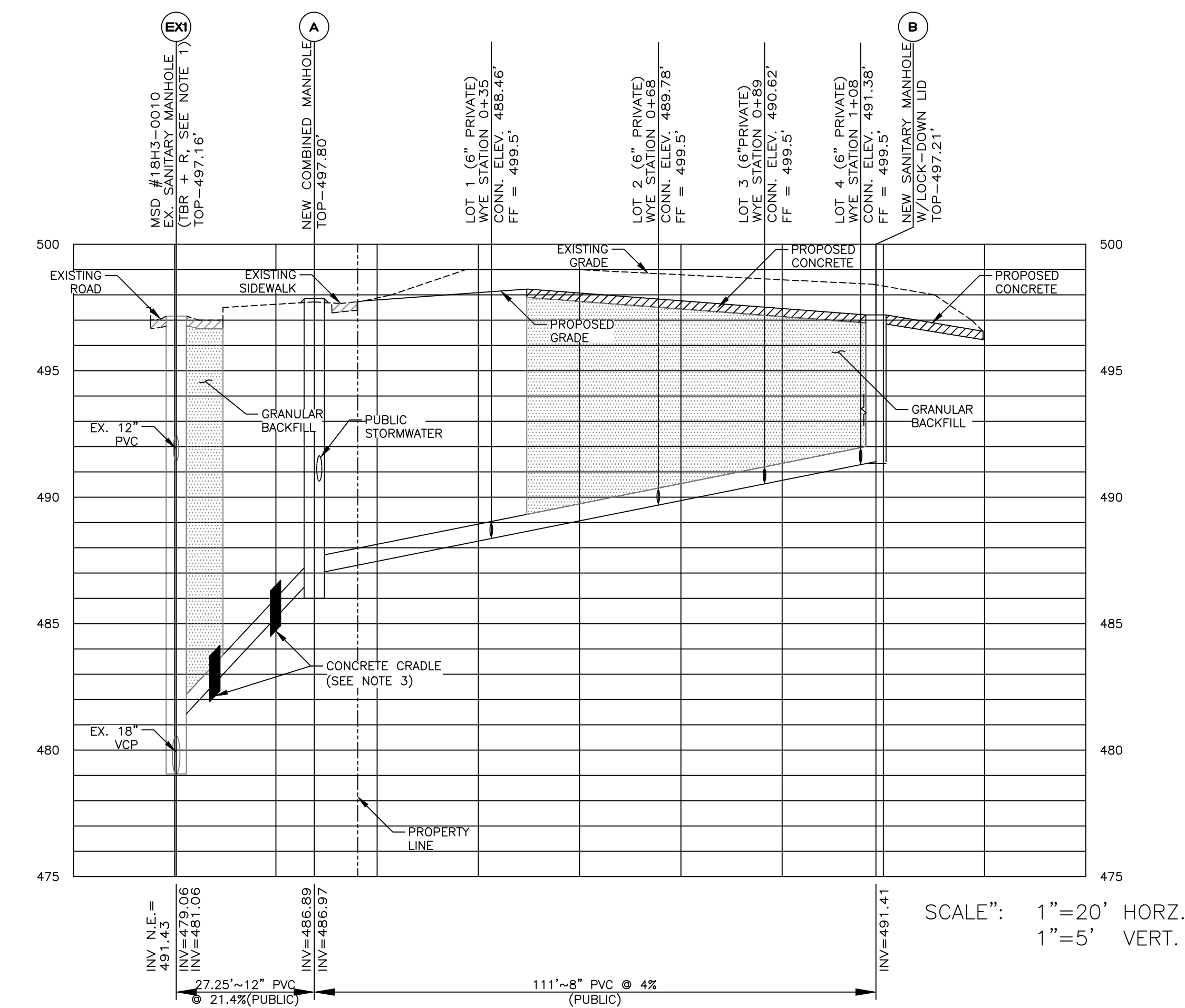
GRAPHIC SCALE



HYDRAULIC CALCULATION SHEET (SEE DRAINAGE AREA MAP FOR P.I. AND Q (inflow) FOR EACH STRUCTURE)														
Project name: SKINKER DEBALIVIERE			Calculated By: L.LICARI											
Project number: 14857			Checked By: D.VONARY											
Project Location: 521 DES PERES AVENUE			Date: 14-Aug-17											
Structure Number	LINE		FLOW LINE ELEVATIONS		Length (ft)	Flowline Grade ft/ft	Pipe Size (in.)	Full Flow Cap. (cfs)	Total (Q) (cfs)	Mean Full Flow Vel.(V) (ft/s)	Bend Coef.	Head (V _h) (ft)	QV _h (ft ³ /s)	Pipe Coef. (n)
	Upper structure	Lower structure	Upper structure	Lower structure										
D	D	C	493.00	490.88	98.51	0.0215	12	5.68	0.40	0.50	0	0.00	0.00	0.012
C	C	A	490.88	490.61	12.49	0.0216	12	5.69	0.40	0.50	0.3	0.00	0.00	0.012
A	A	EX1	486.89	481.06	27.25	0.2139	12	17.90	0.40	0.50	0.11	0.00	0.00	0.012
EX1														
FORMULAS:														
MEAN FULL FLOW VELOCITY: $V = Q_{AC}/A_{PIPE}$														
FRICTION LOSS (H _f): $H_f = 2.87 n^2 (L/V^4) (d^{-5/2})$														
VELOCITY HEAD: $V_h = V^2/2g$														
JUNCTION LOSSES (JUNC.) = $[Q_{sub}V_{sub}/\sum(Q_{sub}V_{sub})] [Q_{sub}/2g]$														
BEND LOSSES (BEND) = $(V^3/2g) \cdot \text{ANGLE COEFFICIENT}$														
Note: 1. IF MORE THAN ONE COMING LINE, CALCULATE EACH BEND LOSS AND ADD TOGETHER.														
2. NO STRUCTURE LOSSES TO BE CALCULATED AT A DROP														
3. IF $QV_{sub} > QV_{sub,limit}$, NO JUNCTION LOSSES TO BE CALCULATED.														



STORM SEWER PROFILE



SANITARY SEWER PROFILE

UTILITY PLAN/SANITARY PROFILE

MSD BASE MAP - 18H3
MSD P-31231-00
ZIP CODE 63134
CITY BLOCK 5423

Revisions

Date	Revised Per MSD Comments
06/23/2017	
08/15/2017	

WALKER TOWNHOMES
521 DES PERES AVENUE
ST. LOUIS, MO 63112

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CERTIFICATE OF AUTHORITY 0975

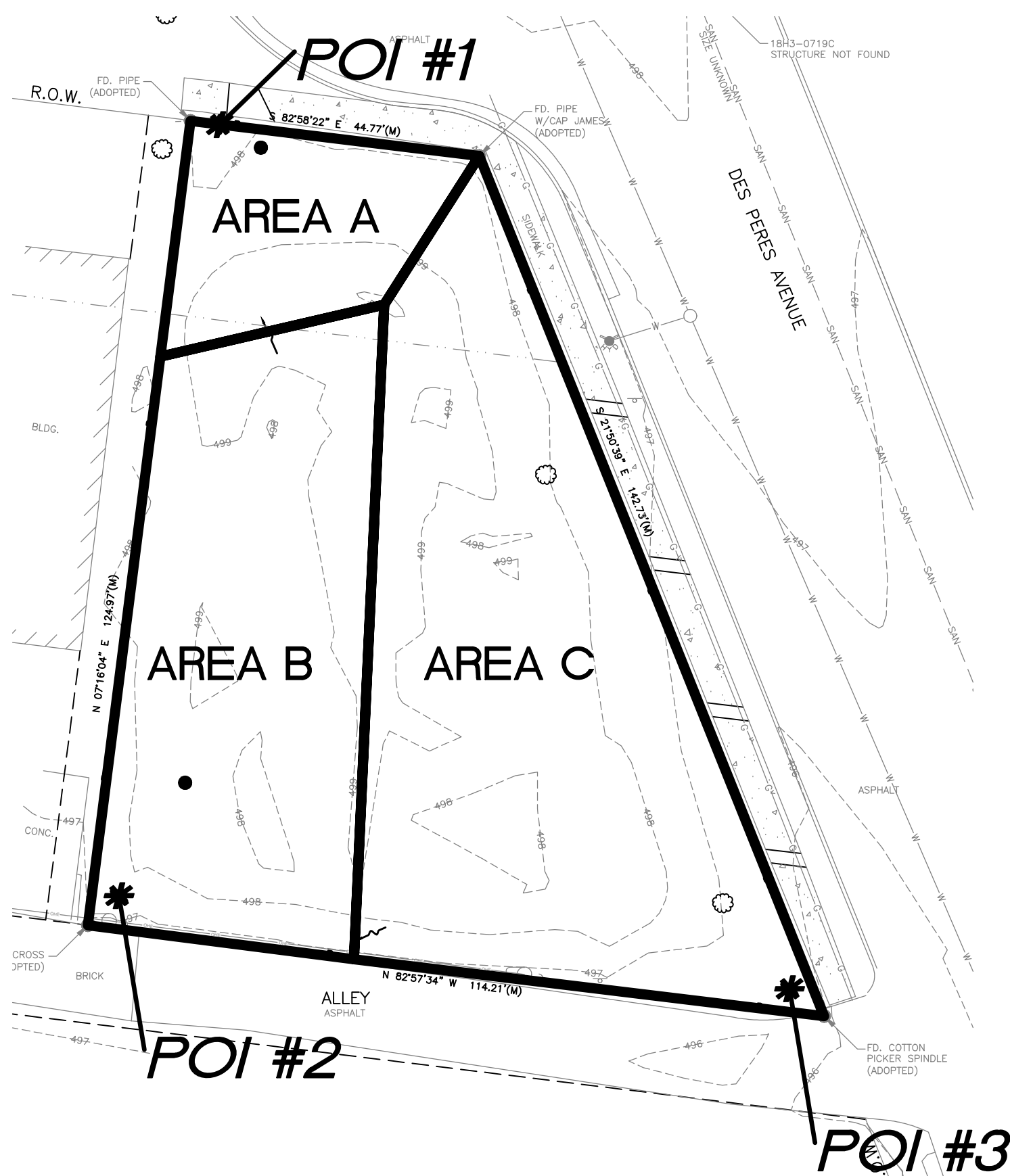
SKINKER DEBALIVIERE COMMUNITY
HOUSING CORPORATION
6008 KINGSBURY AVENUE
ST. LOUIS, MO 63112

ISSUE DATE
05/17/2017

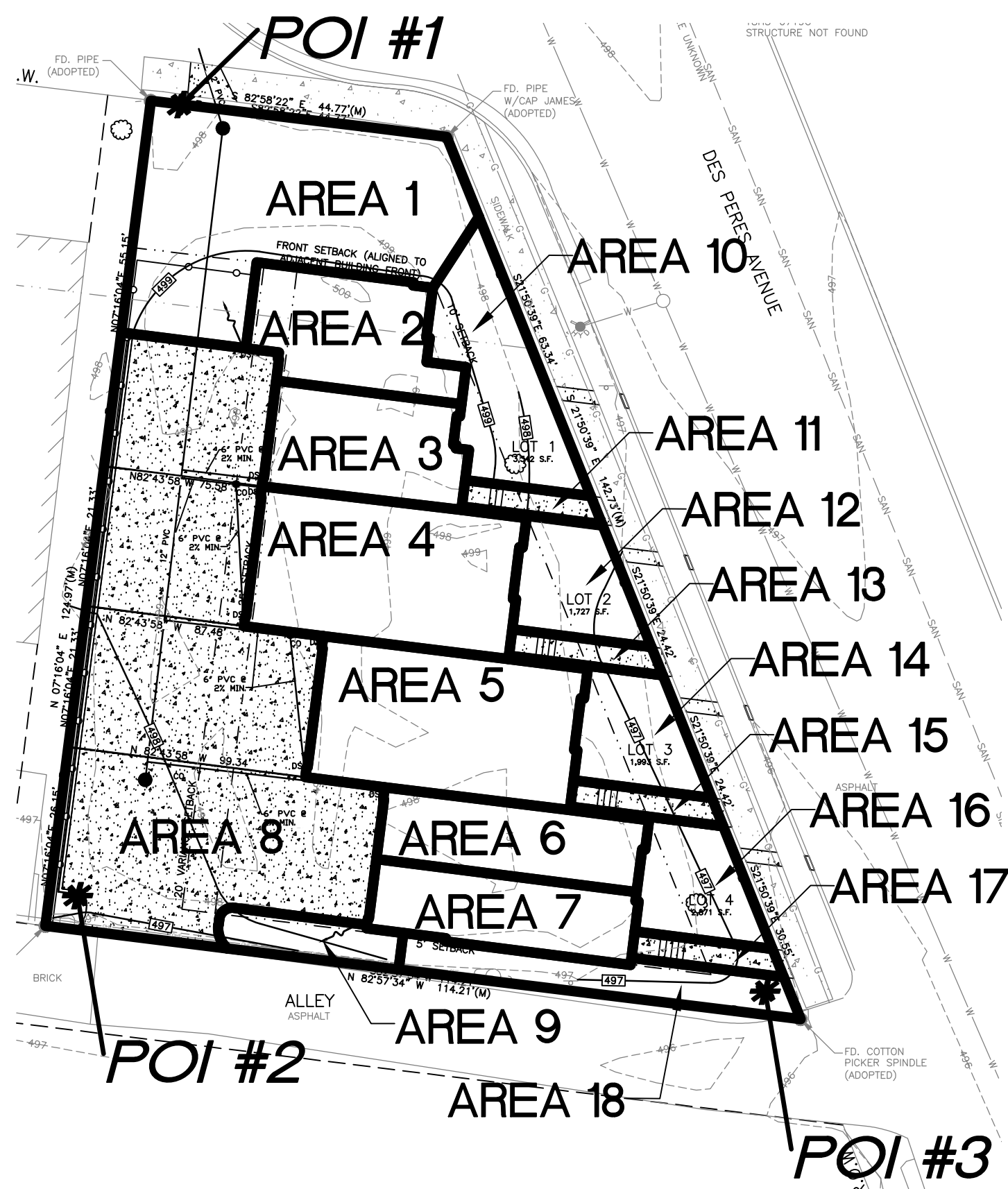
SCALE
1"=20'

Job Number
14857

Sheet Number
C5



PRE-DEVELOPED DRAINAGE AREA PLAN



POST-DEVELOPED DRAINAGE AREA PLAN

DIFFERENTIAL RUNOFF (20YR 20 MIN)

PRE-DEVELOPED CONDITION RUNOFF: QPRE
"AREA A" = 0.03 AC. X 1.78 CFS/AC. = 0.05 CFS
POI #1 SUM = 0.05 CFS
"AREA B" = 0.08 AC. X 1.78 CFS/AC. = 0.14 CFS
POI #2 SUM = 0.14 CFS
"AREA C" = 0.12 AC. X 1.78 CFS/AC. = 0.21 CFS
POI #3 SUM = 0.21 CFS
PRE-DEVELOPED RUNOFF TOTAL: QPRE = 0.40 CFS

POST-DEVELOPED CONDITION RUNOFF: QPOST
"AREA 1" = 0.030 AC. X 1.78 CFS/AC. = 0.053 CFS
"AREA 2" = 0.011 AC. X 3.70 CFS/AC. = 0.041 CFS
"AREA 3" = 0.011 AC. X 6.0 CFS/AC. = 0.066 CFS
"AREA 4" = 0.019 AC. X 6.0 CFS/AC. = 0.114 CFS
"AREA 5" = 0.019 AC. X 6.0 CFS/AC. = 0.114 CFS
"AREA 6" = 0.010 AC. X 6.0 CFS/AC. = 0.060 CFS
POI #1 SUM = 0.448 CFS
"AREA 7" = 0.010 AC. X 3.70 CFS/AC. = 0.037 CFS
"AREA 8" = 0.067 AC. X 3.70 CFS/AC. = 0.248 CFS
"AREA 9" = 0.004 AC. X 1.78 CFS/AC. = 0.007 CFS
POI #2 SUM = 0.292 CFS

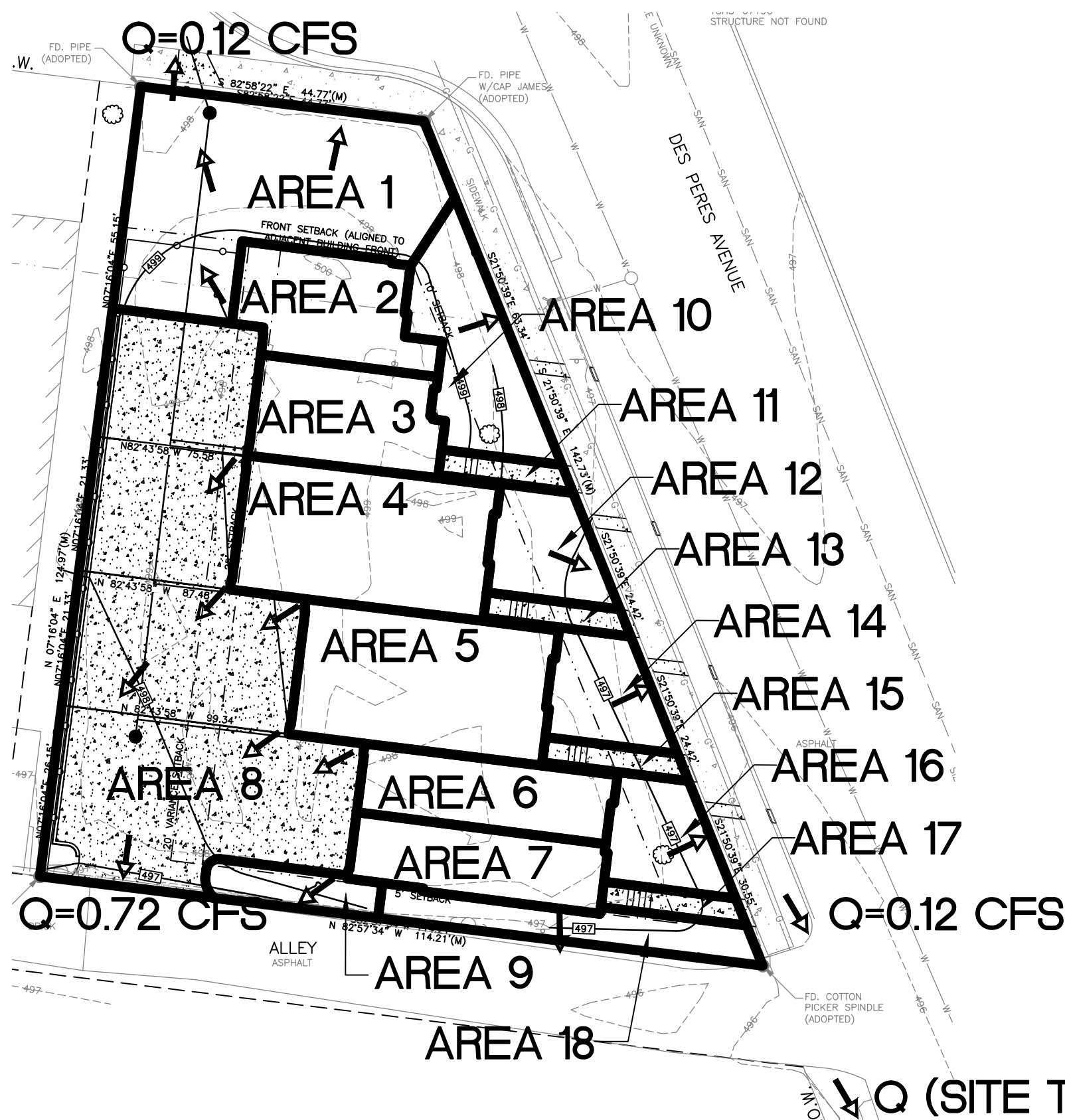
"AREA 10" = 0.012 AC. X 1.78 CFS/AC. = 0.020 CFS
"AREA 11" = 0.002 AC. X 3.70 CFS/AC. = 0.010 CFS
"AREA 12" = 0.007 AC. X 1.78 CFS/AC. = 0.010 CFS
"AREA 13" = 0.002 AC. X 3.70 CFS/AC. = 0.010 CFS
"AREA 14" = 0.007 AC. X 1.78 CFS/AC. = 0.010 CFS
"AREA 15" = 0.002 AC. X 3.70 CFS/AC. = 0.010 CFS
"AREA 16" = 0.007 AC. X 1.78 CFS/AC. = 0.010 CFS
"AREA 17" = 0.002 AC. X 3.70 CFS/AC. = 0.010 CFS
"AREA 18" = 0.007 AC. X 1.78 CFS/AC. = 0.012 CFS
POI #3 SUM = 0.102 CFS

POST-DEVELOPED RUNOFF TOTAL: QPOST = 0.84 CFS

DIFFERENTIAL RUNOFF: (POST-DEVELOPED) - (PRE-DEVELOPED)

POI #1: 0.448 - 0.050 = 0.398
POI #2: 0.292 - 0.140 = 0.152
POI #3: 0.102 - 0.210 = -0.108

TOTAL POST-DEVELOPED DIFFERENTIAL RUNOFF:
(QPOST) - (QPRE) = 0.84 CFS - 0.40 CFS = 0.44 CFS < 2.0 CFS
THEREFORE, STORMWATER DETENTION FOR THIS DEVELOPED SITE IS NOT REQUIRED



POST-DEVELOPED OVERLAND FLOWPATH PLAN

OVERLAND FLOWPATH (100YR 20 MIN)

POST-DEVELOPED CONDITION RUNOFF: QPOST

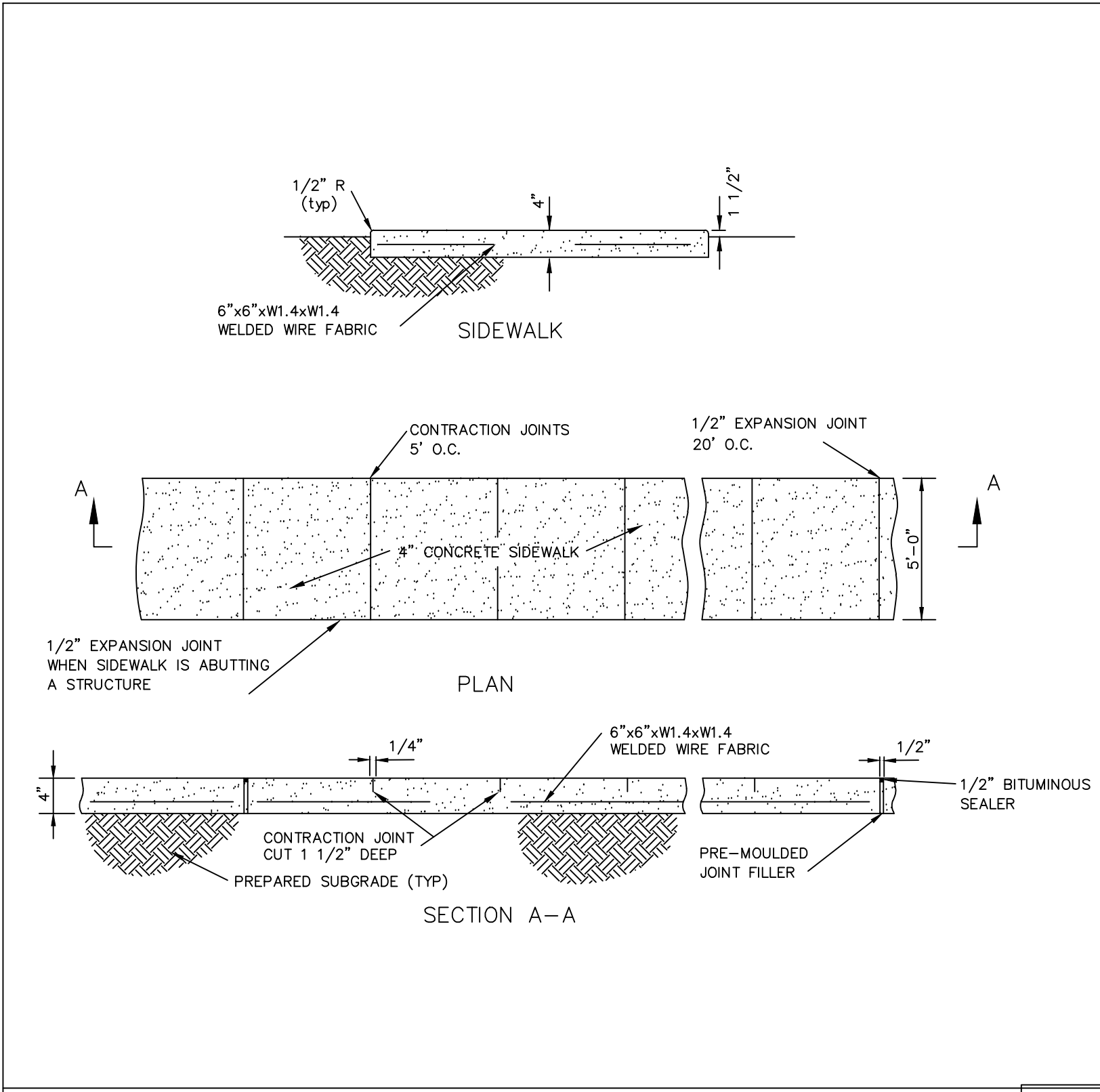
"AREA 1" = 0.030 AC. X 2.29 CFS/AC. = 0.069 CFS
"AREA 2" = 0.011 AC. X 4.77 CFS/AC. = 0.052 CFS
"AREA 3" = 0.011 AC. X 6.0 CFS/AC. = 0.066 CFS
"AREA 4" = 0.019 AC. X 6.0 CFS/AC. = 0.114 CFS
"AREA 5" = 0.019 AC. X 6.0 CFS/AC. = 0.114 CFS
"AREA 6" = 0.010 AC. X 6.0 CFS/AC. = 0.060 CFS
"AREA 7" = 0.010 AC. X 4.77 CFS/AC. = 0.048 CFS
"AREA 8" = 0.067 AC. X 4.77 CFS/AC. = 0.320 CFS
"AREA 9" = 0.004 AC. X 2.29 CFS/AC. = 0.009 CFS
"AREA 10" = 0.012 AC. X 2.29 CFS/AC. = 0.027 CFS
"AREA 11" = 0.002 AC. X 4.77 CFS/AC. = 0.010 CFS
"AREA 12" = 0.007 AC. X 2.29 CFS/AC. = 0.016 CFS
"AREA 13" = 0.002 AC. X 4.77 CFS/AC. = 0.010 CFS
"AREA 14" = 0.007 AC. X 2.29 CFS/AC. = 0.016 CFS
"AREA 15" = 0.002 AC. X 4.77 CFS/AC. = 0.010 CFS
"AREA 16" = 0.007 AC. X 2.29 CFS/AC. = 0.016 CFS
"AREA 17" = 0.002 AC. X 4.77 CFS/AC. = 0.010 CFS
"AREA 18" = 0.007 AC. X 2.29 CFS/AC. = 0.016 CFS

→ 100 YEAR /20MIN OVERLAND FLOW PATH

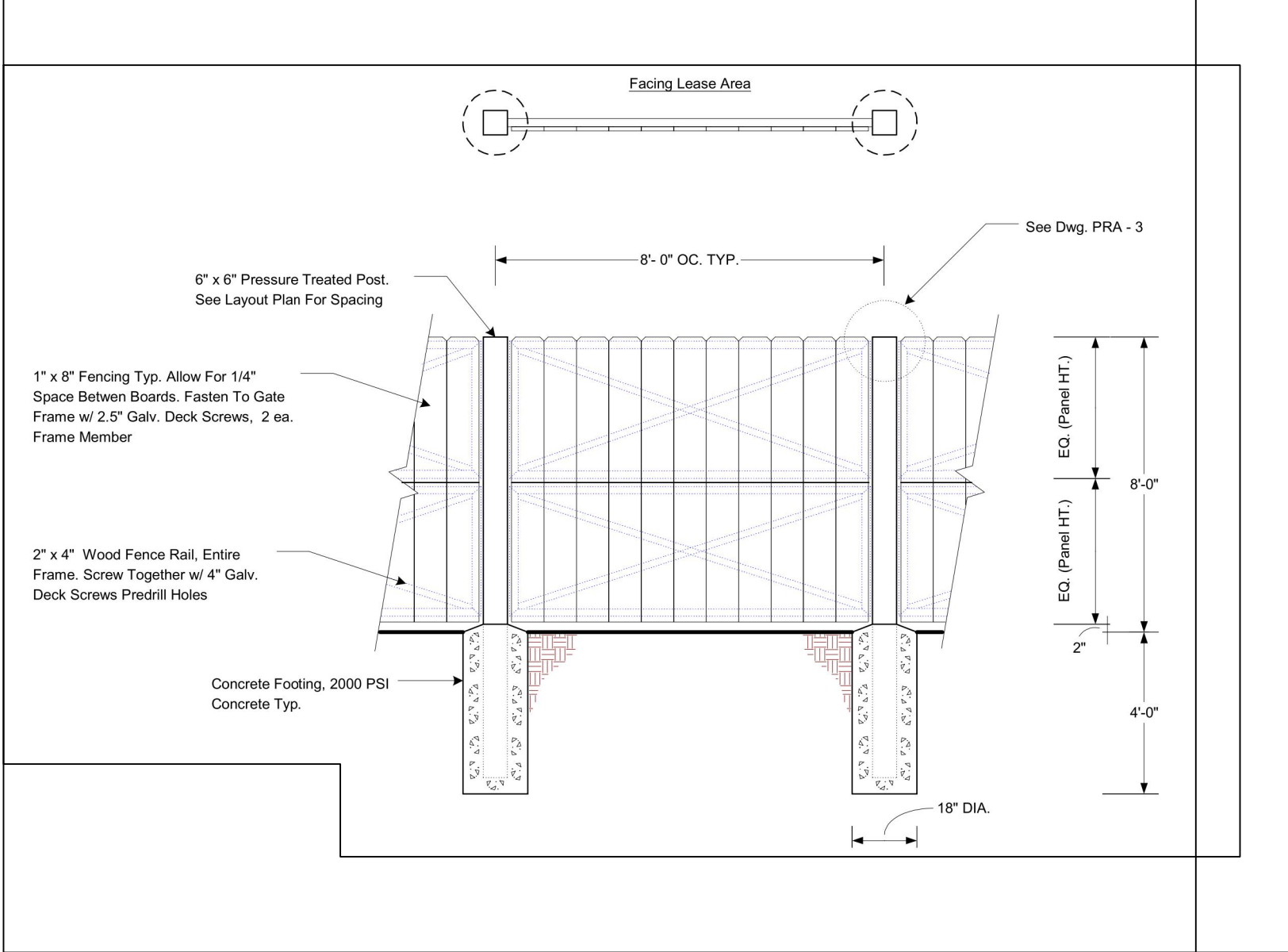
DRAINAGE AREA PLAN

MSD BASE MAP - 18H3
MSD P-31231-00
ZIP CODE 63134
CITY BLOCK 5423

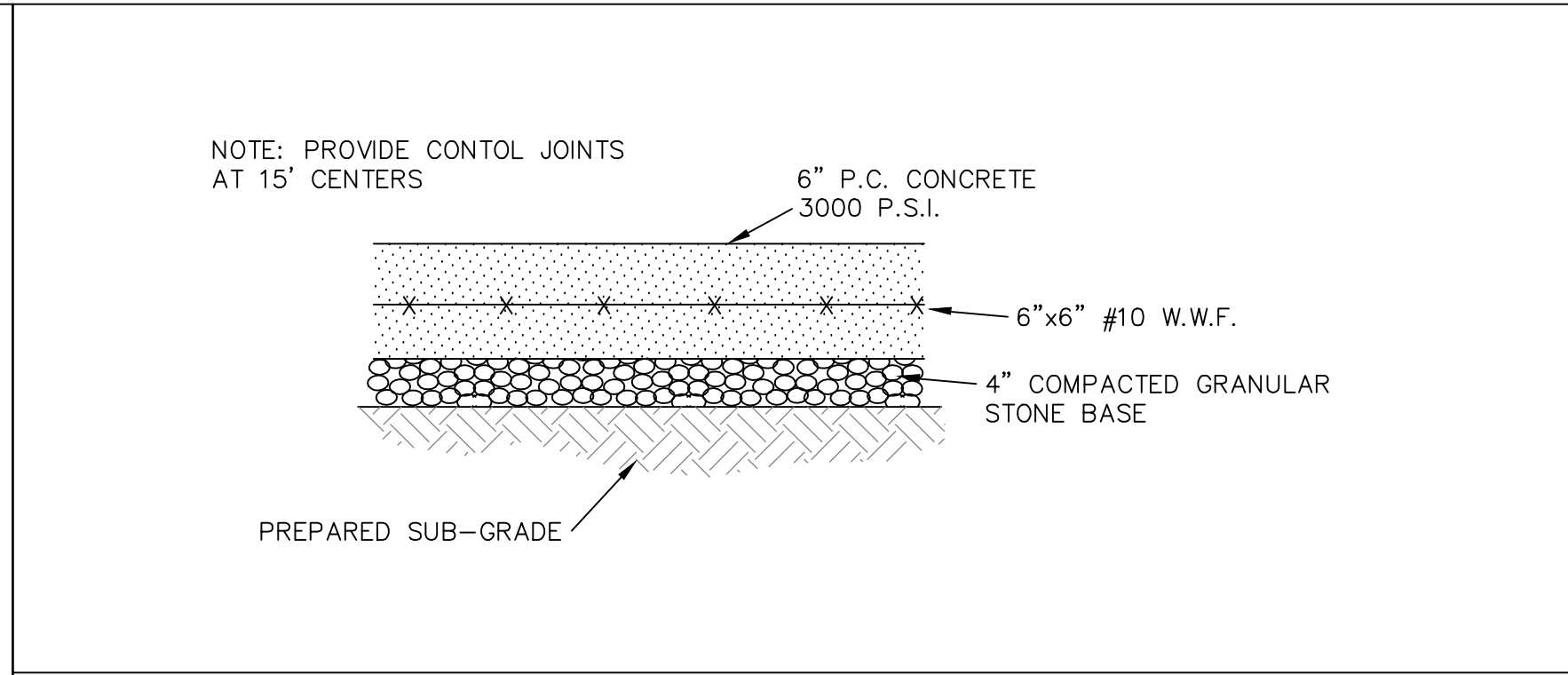
Revisions	REVISED PER MSD COMMENTS	06/23/2017	08/15/2017
Date	06/23/2017	08/15/2017	
WALKER TOWNHOMES 521 DES PERES AVENUE ST. LOUIS, MO 63112			
VonArx Engineering 10748 BUSINESS 21, SUITE A HILLTOP SQUARE, ELLISVILLE, MO 63021 636.797.4425 vonarx@vonarxengineering.com VONARX ENGINEERING, INC. CERTIFICATE OF AUTHORITY 0975			
SKINKER DEBALMIERE COMMUNITY HOUSING CORPORATION 6008 KINGSBURY AVENUE ST. LOUIS, MO 63112			
ISSUE DATE 05/17/2017			
SCALE 1"=20'			
Job Number 14857			
Sheet Number C6			



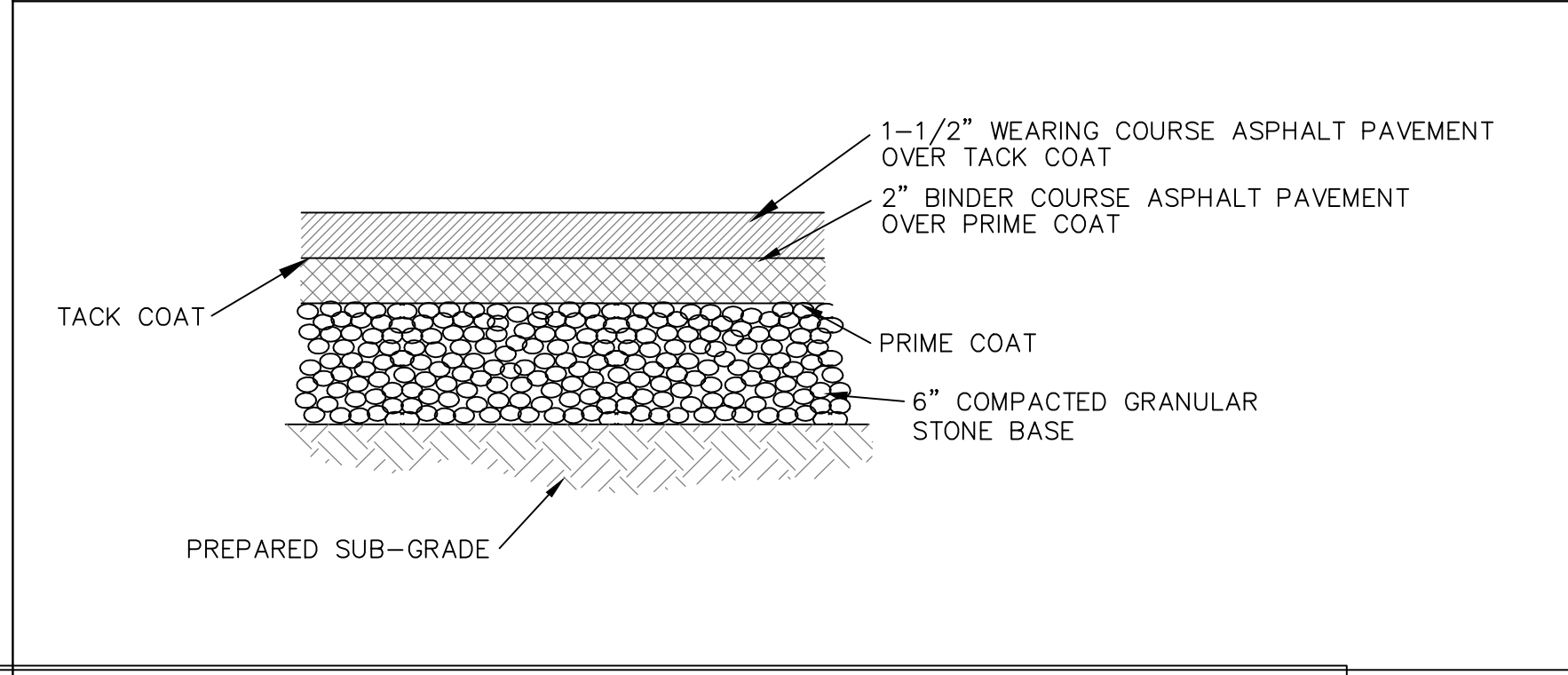
SIDEWALK DETAIL



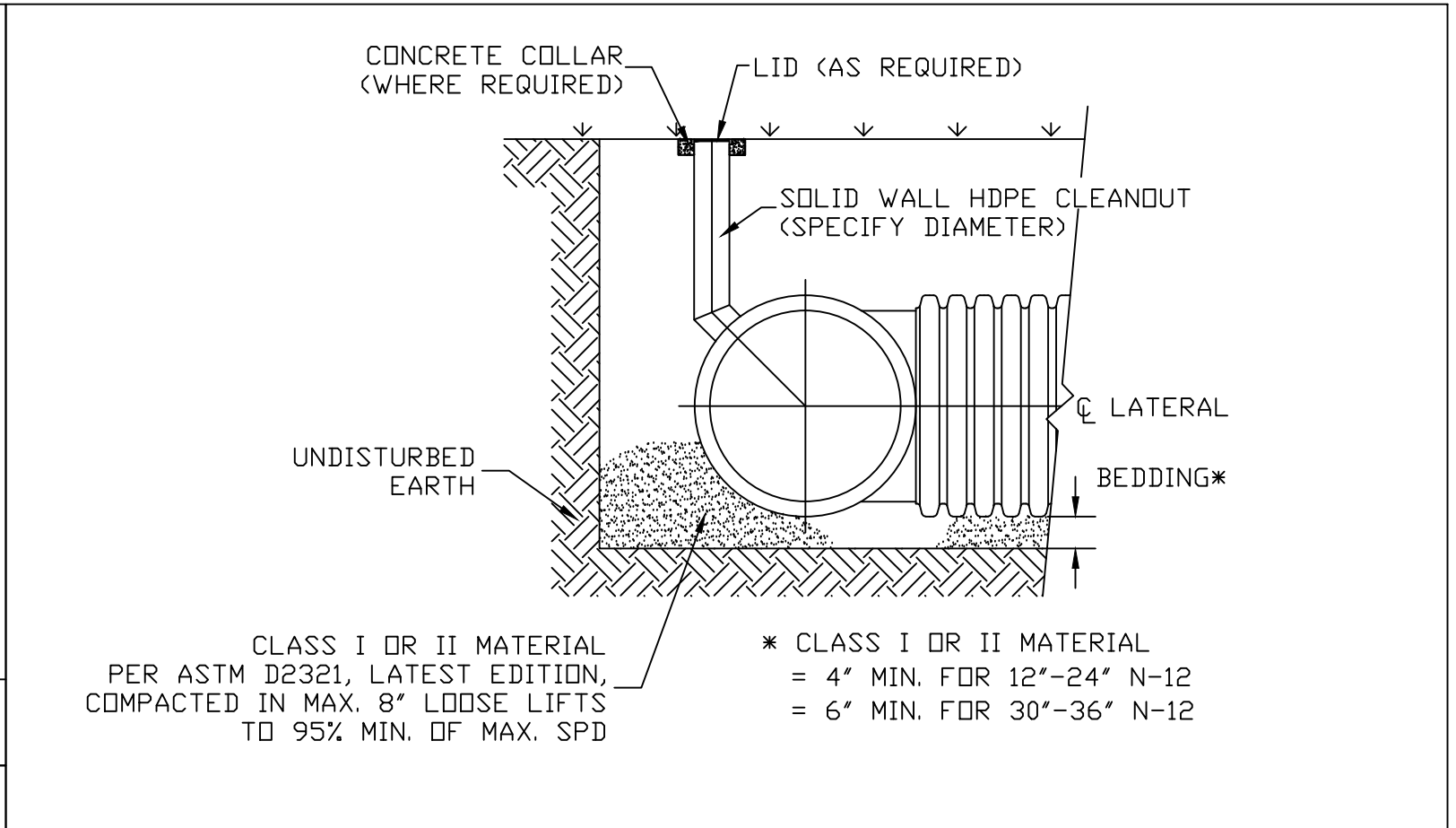
FENCE DETAIL



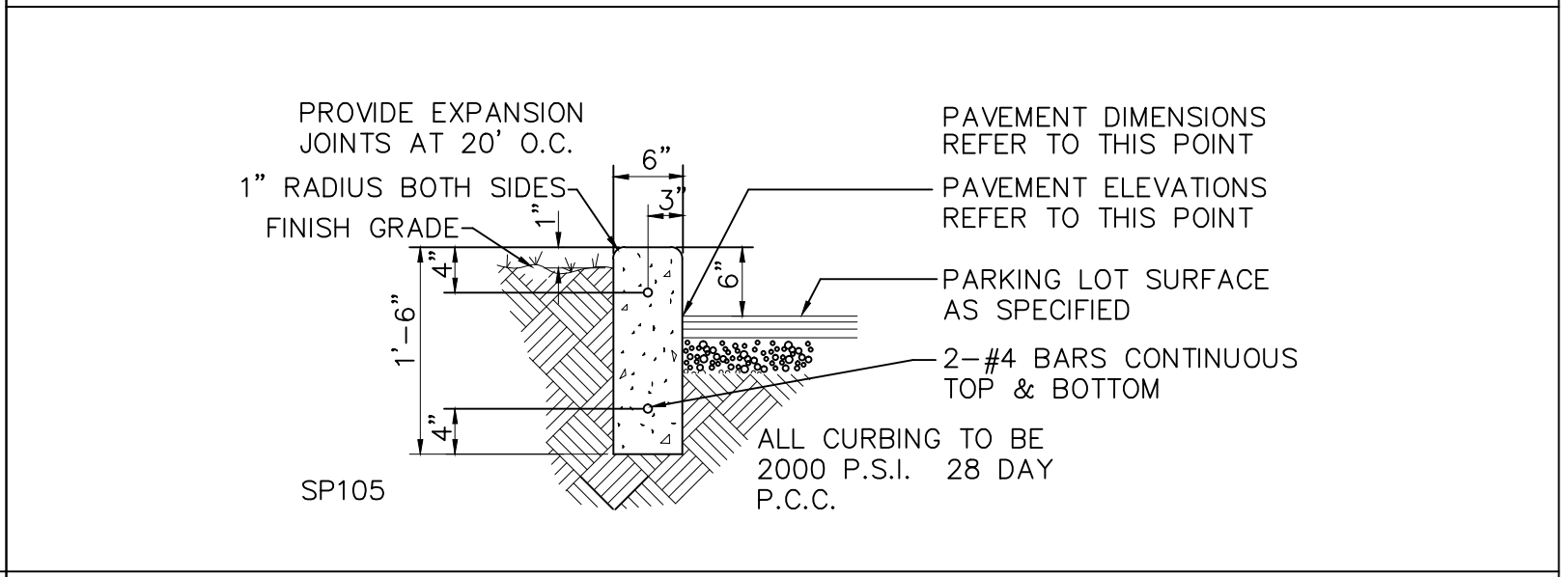
CONCRETE PAVEMENT DETAIL



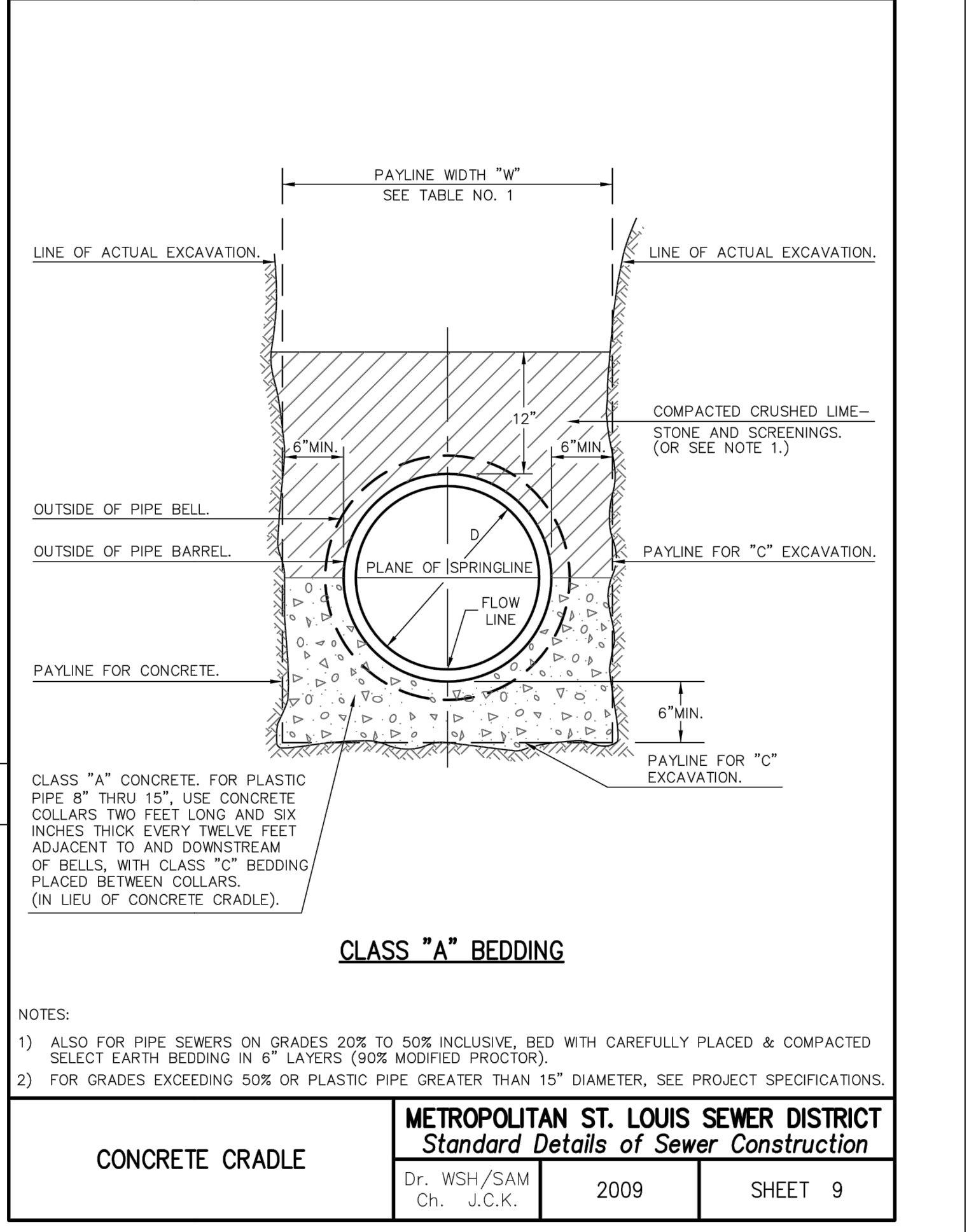
ASPHALT PAVEMENT DETAIL



SANITARY CLEANOUT DETAIL



CONCRETE CURB DETAIL



CLASS "A" BEDDING

NOTES:

1) ALSO FOR PIPE SEWERS ON GRADES 20% TO 50% INCLUSIVE, BED WITH CAREFULLY PLACED & COMPACTED SELECT EARTH BEDDING IN 6" LAYERS (90% MODIFIED PROCTOR).

2) FOR GRADES EXCEEDING 50% OR PLASTIC PIPE GREATER THAN 15" DIAMETER, SEE PROJECT SPECIFICATIONS.

CONCRETE CRADLE	METROPOLITAN ST. LOUIS SEWER DISTRICT <i>Standard Details of Sewer Construction</i>	
	Dr. WSH/SAM Ch. J.C.K.	2009
		SHEET 9

MSD BASE MAP - 18H3
MSD P-31231-00
ZIP CODE 63134
CITY BLOCK 5423

CONSTRUCTION DETAILS

Revisions

Date	REVISED PER MSD COMMENTS	REVISED PER MSD COMMENTS
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08/15/2017		

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SCALE
N.T.S.

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