CITY OF LONG BEACH
DEPARTMENT OF PUBLIC WORKS

NASSAU COUNTY **NEW YORK**

NORTH SHORE BULKHEAD PROJECT

CONTRACT (G): GENERAL CONSTRUCTION

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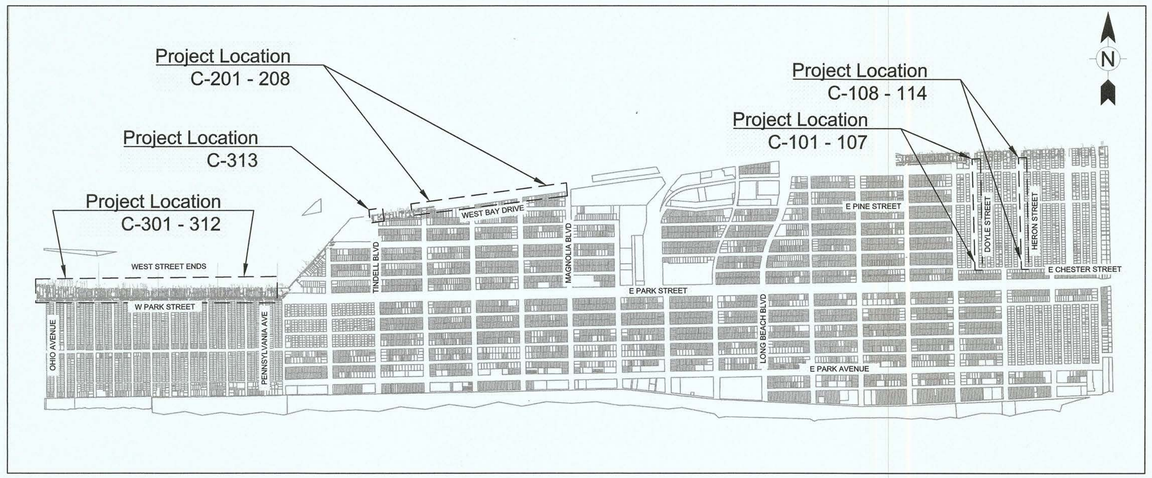

VICINITY MAP
SCALE: 1" = 1250'

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STATE OF NEW YORK
ANDREW TODD CARTER
084969-1
LICENSED PROFESSIONAL ENGINEER
8-5-19

AUGUST 8, 2019

200-01298-16007
100% BID DOCUMENTS

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Plotted: Jul 30, 2019 - 12:58pm by andrew.bathan

GENERAL NOTES

1. ALL LABOR, MATERIALS, AND METHODS OF CONSTRUCTION SHALL BE IN STRICT ACCORDANCE WITH THE MINIMUM ENGINEERING AND CONSTRUCTION STANDARDS ADOPTED BY THE CITY OF LONG BEACH. WHERE CONFLICTS OR OMISSIONS EXIST, THE CITY OF LONG BEACH STANDARDS SHALL DICTATE. SUBSTITUTIONS AND DEVIATION FROM PLANS AND SPECIFICATIONS SHALL BE PERMITTED ONLY WHEN WRITTEN APPROVAL HAS BEEN ISSUED BY THE ENGINEER.

2. ALL WORK SHALL BE IN ACCORDANCE WITH THE MOST CURRENT VERSION OF THE CONSTRUCTION SPECIFICATIONS.

3. SHOP DRAWINGS OF ALL MATERIALS BEING USED SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO INSTALLATION.

4. THE CONTRACTOR SHALL FURNISH, INSTALL, TEST AND COMPLETE ALL WORK TO THE SATISFACTION OF THE ENGINEER AND OWNER IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR MEANS AND METHODS OF CONSTRUCTION; AS SUCH, THESE PLANS DO NOT COMPLETELY REPRESENT, NOR ARE THEY INTENDED TO REPRESENT, ALL SPECIFIC INSTRUCTIONS REQUIRED FOR SITEWORK CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE TO CONSTRUCT ALL IMPROVEMENTS DEPICTED ON THESE PLANS IN ACCORDANCE WITH ALL APPLICABLE RULES, REGULATIONS AND LAWS IN EFFECT AT THE TIME OF CONSTRUCTION.

5. THE CONTRACTOR SHALL ACCEPT THE SITE AS IS. THE CONTRACTOR SHALL ASSESS CONDITIONS, AND THE KIND, QUALITY AND QUANTITY OF WORK REQUIRED. THE OWNER AND ENGINEER MAKE NO GUARANTEE IN REGARD TO THE ACCURACY OF ANY INFORMATION THAT WAS OBTAINED DURING INVESTIGATIONS. THE CONTRACTOR SHALL: MAKE A THOROUGH SITE INSPECTION IN ORDER TO FIELD CHECK EXISTING SITE CONDITIONS; CORRELATE CONDITIONS WITH THE DRAWINGS; AND, RESOLVE ANY POSSIBLE CONSTRUCTION CONFLICTS WITH THE OWNER AND ENGINEER PRIOR TO COMMENCEMENT OF WORK. THE CONTRACTOR SHALL PERFORM ADDITIONAL TOPOGRAPHIC SURVEYS HE/SHE DEEMS NECESSARY, PROVIDED THEY ARE COORDINATED WITH THE OWNER. ANY CONDITIONS DETERMINED BY THE CONTRACTOR THAT DIFFER FROM THE INFORMATION SHOWN ON THE DRAWINGS THAT ARE NOT BROUGHT TO THE ATTENTION OF THE OWNER AND ENGINEER PRIOR TO THE START OF WORK SHALL NOT BE CONSIDERED GROUNDS FOR ADDITIONAL PAYMENT OR CHANGES TO THE CONTRACT DURATION, OR ANY OTHER CLAIMS AGAINST THE OWNER OR OWNER'S ENGINEER.

6. INFORMATION RELATED TO ELEVATIONS AND PROPOSED UTILITIES (SUCH AS ROADWAY GRADES, INVERT ELEVATIONS, RIM ELEVATIONS, GRATE ELEVATIONS, BUILDING FINISHED FLOOR ELEVATIONS, ETC.) MAY BE FOUND IN MORE THAN ONE LOCATION IN THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL SUFFICIENTLY REVIEW ALL PLANS, PROFILES AND ANY OTHER INFORMATION IN THE CONTRACT DOCUMENTS FOR CONSISTENCY PRIOR TO BID. ANY INCONSISTENCIES OR DISCREPANCIES THAT ARE FOUND BY THE CONTRACTOR OR HIS ASSIGNS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE OWNER AND ENGINEER IN WRITING, IN THE FORMAT OF AN RFI PRIOR TO BID.

7. THERE ARE ADDITIONAL NOTES, SPECIFICATIONS AND REQUIREMENTS CONTAINED THROUGHOUT THE PLAN SET AS WELL AS REFERENCES TO SPECIFICATIONS FROM APPLICABLE GOVERNING AUTHORITIES AND INDUSTRY STANDARDS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN, REVIEW AND ADHERE TO ALL THESE DOCUMENTS.

8. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT ALL REQUIRED PERMITS ARE OBTAINED AND IN HAND BEFORE BEGINNING ANY CONSTRUCTION. NO CONSTRUCTION OR FABRICATION OF ANY ITEM SHALL BEGIN UNTIL THE CONTRACTOR HAS RECEIVED ALL PLANS AND ANY OTHER DOCUMENTATION FROM ALL OF THE PERMITTING AND ANY OTHER REGULATORY AUTHORITIES. ANY PENALTIES, STOP WORK ORDERS OR ADDITIONAL WORK RESULTING FROM THE CONTRACTOR BEING IN VIOLATION OF THE REQUIREMENTS ABOVE, SHALL BE FULLY BORNE BY THE CONTRACTOR.

9. THE LOCATION OF ALL EXISTING UTILITIES AND STORM DRAINAGE SHOWN ON THE PLANS HAVE BEEN DETERMINED FROM THE BEST INFORMATION AVAILABLE AND ARE GIVEN FOR THE CONVENIENCE OF THE CONTRACTOR. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR INACCURACY. PRIOR TO THE START OF ANY CONSTRUCTION ACTIVITY IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE VARIOUS UTILITIES AND TO MAKE THE NECESSARY ARRANGEMENTS FOR ANY RELOCATION OF THESE UTILITIES WITH THE OWNER OF THE UTILITY. THE CONTRACTOR SHALL EXERCISE CAUTION WHEN CROSSING UNDERGROUND UTILITIES, WHETHER SHOWN ON THE PLAN OR LOCATED BY THE UTILITY COMPANY. ALL UTILITIES WHICH INTERFERE WITH THE PROPOSED CONSTRUCTION SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER FIRST. ANY FEES ASSOCIATED WITH UTILITY RELOCATIONS SHALL BE BORNE IN ACCORDANCE WITH RESPECTIVE UTILITY COMPANY STANDARDS. ANY DELAY OR INCONVENIENCE CAUSED TO THE CONTRACTOR BY THE RELOCATION OF THE VARIOUS UTILITIES SHALL BE INCIDENTAL TO THE CONTRACT AND NO EXTRA COMPENSATION WILL BE ALLOWED.

10. THE SEQUENCE OF CONSTRUCTION SHALL BE SUCH THAT ALL UNDERGROUND INSTALLATIONS OF EVERY KIND SHALL BE PLACED BENEATH THE PAVEMENT AND ITS EDGES PRIOR TO THE CONSTRUCTION OF THE PAVEMENT. THE PAVEMENT SHALL NOT BE CUT WITHOUT PRIOR APPROVAL OF THE ENGINEER.

11. ANY ON-SITE OR OFFSITE AREAS IMPACTED OR DISTURBED BY CONSTRUCTION ACTIVITIES OR LOADINGS NOT OTHERWISE NOTED ON PLANS SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER BY THE CONTRACTOR AT NO EXPENSE TO THE OWNER.

12. EXISTING BOUNDARY, UTILITY AND TOPOGRAPHIC INFORMATION FOR THE SITE OBTAINED FROM SURVEY BY GAYRON DE BRUIN LAND SURVEYORING AND ENGINEERING, P.C. DATED MAY 2018, AND HIRANI ENGINEERING & LAND SURVEYING, P.C., DATED APRIL 2016, IN THE NORTH AMERICAN VERTICAL DATUM (NAVD88).

13. ALL PERMANENT TRAFFIC INSTALLATIONS AND TEMPORARY TRAFFIC CONTROL MEASURES SHALL FOLLOW THE LATEST MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES WITH NEW YORK SUPPLEMENTS (MUTCD) GUIDELINES.

14. CONTRACTOR TO PROTECT PRIVATE PROPERTY WITHIN AND ADJACENT THE PROJECT SITE. WHILE PRIVATE IMPROVEMENTS ADJACENT TO, THRU, AND OVER THE EXISTING BULKHEADS ARE TO BE REMOVED UNDER A SEPARATE CONTRACT. ANY PRIVATE PROPERTY IMPACTED OR DISTURBED BY CONSTRUCTION ACTIVITIES OR LOADINGS SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER BY THE CONTRACTOR AT NO EXPENSE TO THE OWNER. THE CONTRACTOR SHALL NOTIFY THE OWNER AND THE ENGINEER OF ANY IMPEDIMENTS TO THE WORK TWO (2) WEEKS PRIOR TO THE DELAY OF WORK.

CONSTRUCTION MONITORING

1. CONTRACTOR TO INSTALL VIBRATION MONITORING DURING CONSTRUCTION AS SPECIFIED IN SECTION 40 77 23 OF THE PROJECT MANUAL - ITEM 25.

2. CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLYING WITH CITY OF LONG BEACH ORDINANCE CHAPTER 16 REGARDING NOISE DURING CONSTRUCTION. SPECIFICALLY, THE CONTRACTOR SHALL NOT OPERATE ANY DEVICE, VEHICLE, CONSTRUCTION EQUIPMENT, OR LAWN EQUIPMENT WITHOUT A WORKING MUFFLER AND SAID DEVICE, VEHICLE, OR EQUIPMENT SHALL NOT BE OPERATED OUTSIDE OF THE INDICATED HOURS AND DAYS INDICATED IN THE CITY ORDINANCES AND CONTRACT SPECIFICATIONS.

TIDAL INFORMATION

1. ALL ELEVATIONS ARE IN FEET AND REFER TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). WATER LEVEL DATA IS BASED ON NOAA LONG BEACH STATION 8516663 DATA, MODIFIED USING NOAA RECOMMENDED METHODOLOGY TO CONVERT THE NOAA STATION DATUM TO NAVD88.

   1.1. MEAN HIGHER HIGH WATER (MHHW): 2.34'
   1.2. MEAN HIGH WATER (MHW): 2.05'
   1.3. NAVD88: 0.00'
   1.4. LOCAL MEAN SEA LEVEL (LMSL): -0.12'
   1.5. MEAN TIDE LEVEL (MTL): -0.17'
   1.6. MEAN LOW WATER (MLW): -2.39'
   1.7. MEAN LOWER LOW WATER (MLLW): -2.55'

UTILITY NOTES

1. ALL ON-SITE UTILITIES SHALL BE UNDERGROUND AS APPLICABLE, UNLESS OTHERWISE NOTED.

2. THE CONTRACTOR MUST VERIFY THE LOCATION, AND SIZE OF THE EXISTING WATER, SEWER, GAS, ELECTRIC, TELECOMMUNICATIONS INFRASTRUCTURE PRIOR TO BEGINNING ANY SITE OR BUILDING CONSTRUCTION.

3. CONTRACTOR SHALL MAINTAIN A MINIMUM OF 54 INCHES OF COVER FROM THE TOP OF PIPE FOR ALL WATER DISTRIBUTION PIPING.

4. CONTRACTOR TO DETERMINE APPROPRIATE BENDS OF WATER MAIN FITTINGS.

5. THRUST BLOCKS SHALL BE PROVIDED AT ALL TEES, BENDS, ELBOWS, AND PLUGS FOR THE WATER MAIN.

6. WATER MAINS CROSSING SEWERS SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL DISTANCE OF 18 INCHES AND HORIZONTAL DISTANCE OF 10 FEET BETWEEN THE OUTSIDE OF WATER MAIN AND THE OUTSIDE OF SEWER. IN CASES WHERE THE VERTICAL SEPARATION IS LESS THAN 18 INCHES AND HORIZONTAL IS LESS THAN 10 FEET OR AS OTHERWISE SPECIFIED ON THESE PLANS, STORM OR SANITARY SEWER PIPE SHALL BE ENCASED WITH CONCRETE 5 FEET MINIMUM IN EACH DIRECTION OF PIPE RUN AND 6 INCHES MINIMUM AROUND THE PIPE DIAMETER. AT ALL CROSSINGS ONE FULL LENGTH OF WATER PIPE SHALL BE LOCATED SO BOTH JOINTS WILL BE AS FAR FROM THE SEWER AS POSSIBLE.

7. THE CONTRACTOR SHALL NOTIFY UTILITY COMPANIES WHICH MAY HAVE THEIR UTILITIES WITHIN THE CONSTRUCTION AREAS TO LOCATE THEIR FACILITIES IN THE FIELD FORTY-EIGHT (48) HOURS PRIOR TO BEGINNING CONSTRUCTION.

8. ALL POTABLE WATER PIPE AND FITTINGS SHALL BE PRESSURE TESTED & LEAKAGE TESTED AS SPECIFIED IN SECTION 331413 OF THE PROJECT MANUAL & BY APPROVED TOWN, STATE & FEDERAL STANDARDS.

9. CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN OF ALL SUPPORT OF EXCAVATIONS. CONTRACTOR SHALL SUBMIT METHODS FOR EXCAVATION SUPPORT SIGNED AND SEALED BY ENGINEER LICENSED IN NEW YORK STATE FOR REVIEW BY OWNERS ENGINEER. METHODS SHALL INCLUDE PROCEDURES FOR MONITORING OF UTILITIES AND ADJACENT STRUCTURES DURING THE WORK.

DEMOLITION

1. THE CONTRACTOR SHALL INSPECT THE SITE THOROUGHLY AND FIELD VERIFY THE LOCATION AND DEPTH OF ALL EXISTING UTILITIES. SOME UNDERGROUND UTILITIES MAY BE LOCATED DIFFERENTLY THAN SHOWN ON THESE PLANS. ALL CONTRACTORS USING THESE PLANS FOR DEMOLITION OR CONSTRUCTION SHALL CONFIRM ALL UTILITIES IN THE FIELD TO ESTABLISH LOCATIONS. SIZES, MATERIALS, AND ELEVATIONS. ANY DISCREPANCIES SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE ENGINEER.

2. PRIOR TO COMMENCEMENT OF ANY DEMOLITION WORK, THE CONTRACTOR SHALL INSTALL SOIL EROSION MEASURES AS INDICATED ON THE SOIL EROSION AND SEDIMENT CONTROL PLAN.

3. THE CONTRACTOR SHALL OBTAIN NECESSARY PERMITS AND LICENSES FOR PERFORMING THE DEMOLITION WORK AND SHALL FURNISH A COPY OF SAME TO THE ENGINEER PRIOR TO COMMENCING THE WORK. THE CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OF THE PERMITS.

4. THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES OR LOCAL AUTHORITIES FURNISHING GAS, WATER, ELECTRICAL, TELEPHONE, OR SEWER SERVICE SO THEY CAN REMOVE, RELOCATE, DISCONNECT, CAP OR PLUG THEIR EQUIPMENT IN ORDER TO FACILITATE DEMOLITION.

5. THE CONTRACTOR SHALL PROTECT ALL UTILITIES AND OTHER IMPROVEMENTS SHOWN ON THESE PLANS AND UTILITIES AND OTHER IMPROVEMENTS NOT SHOWN. THE CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR REPAIRS OF UTILITIES AND OTHER IMPROVEMENTS DAMAGED DURING CONSTRUCTION AND SHALL MAINTAIN SUFFICIENT PROTECTION FOR ALL UTILITIES REQUIRED TO PROTECT THEM FROM DAMAGE AND TO PROTECT THE PUBLIC DURING CONSTRUCTION.

6. THE CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF ALL TREES, STRUCTURES, AND UTILITIES NOT MARKED FOR REMOVAL OR DEMOLITION AND SHALL PROMPTLY REPAIR ANY DAMAGE AS DIRECTED BY THE ENGINEER AT NO COST TO THE OWNER.

7. TREES NOT MARKED FOR REMOVAL SHALL BE PROTECTED IN ACCORDANCE WITH CITY OF LONG BEACH REGULATIONS.

8. THE CONTRACTOR SHALL REMOVE UNSALVAGEABLE MATERIALS AND YARD WASTE FROM THE SITE IMMEDIATELY AND DISPOSE OF IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS.

9. THE CONTRACTOR SHALL SAW-CUT A SMOOTH STRAIGHT EDGE ON ANY PAVEMENT PROPOSED FOR DEMOLITION PRIOR TO ITS REMOVAL. PRIOR TO CONNECTING PROPOSED PAVEMENT TO EXISTING PAVEMENT, THE CONTRACTOR SHALL ENSURE THAT THE EDGE OF THE EXISTING PAVEMENT IS STRAIGHT AND UNIFORM.

10. CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND PROPER DISPOSAL OF ALL REMOVED/DEMOLISHED PIPE, STRUCTURES, EQUIPMENT, AND APPURTENANCES.

11. CONTRACTOR SHALL PROTECT AND MAINTAIN ALL TREES AND SHRUBS IN AND ADJACENT TO THE AREA OF CONSTRUCTION. CONTRACTOR SHALL NOTIFY THE CITY OF LONG BEACH IF ANY TREES OR SHRUBS DIRECTLY CONFLICT WITH THE WORK TO REQUEST AUTHORIZATION FOR TRIMMING OR REMOVAL. CONTRACTOR IS RESPONSIBLE FOR THE HEALTH OF ANY TRIMMED VEGETATION AND SHALL REPLACE ANY REMOVED VEGETATION IN KIND.

MAINTENANCE AND PROTECTION OF TRAFFIC

1. CONTRACTOR IS REQUIRED TO MAINTAIN ONE-WAY TRAFFIC ON DOYLE AND HERON STREETS DURING DAILY CONSTRUCTION OPERATIONS, PROVIDING TEMPORARY TRAFFIC CONTROL DEVICES AS REQUIRED BY THE LATEST VERSION OF THE MUTCD - ITEM 26.

2. CONTRACTOR IS REQUIRED TO MAINTAIN EXISTING TRAFFIC PATTERNS ON WEST BAY DRIVE DURING DAILY CONSTRUCTION OPERATIONS, PROVIDING TEMPORARY TRAFFIC CONTROL DEVICES AS REQUIRED BY THE LATEST VERSION OF THE MUTCD - ITEM 26.

3. CONTRACTOR IS REQUIRED TO MAINTAIN ACCESS TO PRIVATE DRIVEWAYS AT THE WESTERN STREET END BULKHEAD SITES DURING DAILY CONSTRUCTION OPERATIONS, PROVIDING TEMPORARY TRAFFIC CONTROL DEVICES AS REQUIRED BY THE LATEST VERSION OF THE MUTCD - ITEM 26.

4. CONTRACTOR WILL NOT STAGE EQUIPMENT AND MATERIALS WITHIN THE ROADWAYS OVERNIGHT.

5. STAGING SHALL BE PROVIDED OFFSITE BY THE CITY OF LONG BEACH AND LIMITED QUANTITIES OF MATERIAL AND EQUIPMENT MAY BE STAGED ADJACENT TO THE PROPOSED WORK AT THE OWNER'S DISCRETION.

EARTHWORK, GRADING, STABILIZATION, PAVING AND DRAINAGE

1. COMPACT ALL UTILITY TRENCHES WITHIN TO 95% OF THE MODIFIED PROCTOR MAXIMUM DENSITY (AASHTO T-180).

2. ALL PAVEMENT MARKINGS SHALL BE REPLACED IN KIND TO EXISTING CONDITION AND IN ACCORDANCE WITH NYSDOT REQUIREMENTS.

3. PLANS AND SPECIFICATIONS REQUIRE THAT COMPACTED BACKFILL BE PLACED ALONG SIDE OF AND OVER ALL UTILITIES.

4. THE CONTRACTOR MUST INSTALL AND MAINTAIN GRASS ON EXPOSED SLOPES WITHIN SEVEN DAYS OF COMPLETED FINAL GRADES, AS NOTED ON PLANS, AND AT ANY OTHER TIME AS NECESSARY TO PREVENT EROSION, SEDIMENTATION OR TURBID DISCHARGES TO ANY DOWNSTREAM WATER BODY, WETLAND, OR OFF-SITE PROPERTY. SODDING ON SLOPES 3:1 AND STEEPER SHALL BE STAKED.

5. SITE GRADING SHALL NOT PROCEED UNTIL EROSION CONTROL MEASURES HAVE BEEN INSTALLED.

6. ALL PROPOSED STORM DRAINAGE PIPING SHALL BE TEMPORARILY PROTECTED WITH REQUIRED MINIMUM COVER FOR CONSTRUCTION.

7. SPOT ELEVATIONS SHOWN AT CURB LINES DENOTE PAVEMENT ELEVATIONS.

8. PLAN AND PROFILE STRUCTURES ARE SYMBOLS THAT ARE PROVIDED FOR REFERENCE, AND ARE NOT TO BE USED AS THE BASIS FOR CONSTRUCTION. CONTRACTOR SHALL PROVIDE SHOP DRAWINGS OF ALL DRAINAGE, SANITARY, AND UTILITY STRUCTURES TO ENGINEER.

9. IMPORTED FILL SHALL CONTAIN NO CONTAMINATION EXCEEDING OF THE PROJECT STATE ENVIRONMENTAL REVIEW AGENCY STANDARDS AND MEET THE ENVIRONMENTAL REQUIREMENTS FOR THE PROJECT. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION OF COMPLIANCE PRIOR TO DELIVERY OF ANY FILL TO THE SITE.

EROSION AND SEDIMENT CONTROL

1. TEMPORARY AND PERMANENT SEEDING, SODDING AND PLANTING WILL BE INSPECTED FOR BARE SPOTS, WASHOUTS, AND HEALTHY GROWTH.

2. STABILIZED CONSTRUCTION ENTRANCES AND ROADWAYS SHALL BE MAINTAINED TO PREVENT CLOGGING OF ROCK BEDDING WHICH MAY IMPEDE THE USEFULNESS OF THE STRUCTURE.

3. DISTURB ONLY THE AREA THAT IS NEEDED FOR CONSTRUCTION.

4. ALL DISTURBED AREAS SHOULD BE PERMANENTLY SEEDED OR SODDED WITHIN FOURTEEN (14) DAYS OF CONSTRUCTION COMPLETION.

5. ALL SILT FENCE AND SAFETY BARRIER TO REMAIN IN PLACE UNTIL COMPLETION OF CONSTRUCTION.

6. INSTALL ALL SOIL EROSION CONTROL MEASURES AS SHOWN PRIOR TO ANY LAND DISTURBANCE ACTIVITIES. INSTALL SEDIMENT BARRIERS/SWALES/DITCHES/DIKES AT DOWN SLOPE AREA FROM ALL PROPOSED GRADING OPERATIONS.

7. IF CONSTRUCTION IS SUSPENDED OR COMPLETED, ALL DISTURBED AREAS SHALL BE SEEDED AND MULCHED IMMEDIATELY. ALL SLOPES STEEPER THAN ONE OF THREE (V/H) AND PERIMETER TRENCHES AND TRAP EMBANKMENTS SHALL, ON COMPLETION, BE IMMEDIATELY STABILIZED WITH TEMPORARY SEEDING AND MULCHING.

8. AFTER PAVEMENTS ARE INSTALLED AND PERMANENT VEGETATIVE COVER AND PLANTINGS ARE ESTABLISHED, REMOVE SEDIMENT BARRIERS.

9. EROSION AND SEDIMENT CONTROL MEASURES MUST BE MAINTAINED TO BE EFFECTIVE. IN GENERAL, THESE MEASURES MUST BE PERIODICALLY INSPECTED TO ENSURE STRUCTURAL INTEGRITY, TO DETECT VANDALISM DAMAGE, AND FOR CLEANING AND REPAIR WHENEVER NECESSARY.

10. DURING CONSTRUCTION, ALL STRUCTURES SHOULD BE INSPECTED WEEKLY AND AFTER EVERY RAIN. REMOVE ACCUMULATED SEDIMENT AND STOCKPILE AND STABILIZE IN AN AREA NOT SUBJECT TO FURTHER EROSION.

11. INSTALL TURBIDITY BARRIER IN ACCORDANCE WITH ARMY CORPS OF ENGINEERS ERDC TN-DOER-E21 DATED SEPTEMBER 2005 - ITEM 24.

12. PROVIDE THE LENGTH OF TURBIDITY CURTAIN REQUIRED TO PROVIDE PROTECTION AROUND ALL ACTIVE BULKHEAD WORK AREAS. RELOCATE TURBIDITY CURTAIN AS BULKHEAD WORK AREAS ARE STABILIZED AND NEW AREAS BECOME DISTURBED.

13. PROVIDE EROSION AND SEDIMENTATION CONTROL MEASURES AS REQUIRED TO MEET NYSDEC GUIDELINES.

DESIGN INTENT

1. THE PURPOSE OF THIS PROJECT IS TO PROVIDE PROTECTION TO THE NORTH SHORE OF THE CITY OF LONG BEACH BY CONSTRUCTING NEW BULKHEADS OR IMPROVING EXISTING BULKHEADS TO THE FEMA BASE FLOOD ELEVATION. THE CONTRACTOR IS RESPONSIBLE FOR CONSTRUCTING THE BULKHEADS, AS DESIGNED, UP TO THE APPROPRIATE FEMA BASE FLOOD ELEVATION (BFE). THE FEMA BFE FOR EACH COMPONENT OF THE PROJECT ARE AS FOLLOWS:

   1.1. BULKHEADING AT SARAZEN AND OUIMET CANALS, ALONG DOYLE AND HERON STREETS: ELEV. 9 NAVD88
   1.2. BULKHEAD IMPROVEMENTS AT REYNOLDS CHANNEL, ALONG WEST BAY DRIVE: ELEV. 9 NAVD88
   1.3. BULKHEADING AT WEST STREET ENDS BETWEEN OHIO AVE. AND PENNSYLVANIA AVE., AS WELL AS LINDELL BLVD.: ELEV. 10 NAVD88

2. NEW BULKHEAD SHEETS SHALL BE INSTALLED UP TO THE FEMA BFE, WITH NEW BULKHEAD CAPS CONSTRUCTED ABOVE THE FEMA BFE.THE TOP OF THE FINISHED CONCRETE ALONG WEST BAY DRIVE SHALL BE AT OR ABOVE THE FEMA BFE FOR THE ENTIRE LENGTH OF THE PUBLIC ROW AS SHOWN ON THE PLANS.

3. CONTRACTOR IS RESPONSIBLE FOR PROVIDING AS-BUILT SURVEY, SIGNED AND SEALED BY A NYS LICENSED SURVEYOR, OF THE COMPLETED BULKHEADS AND CAP IMPROVEMENTS TO CONFIRM THAT THE PROJECT, AS CONSTRUCTED, MEETS THE FEMA BFE. IF THE COMPLETED BULKHEAD SHEETS BEFORE SHEETPILE CAP ISNTALLATION OR CONCRETE CAP AT WEST BAY DRIVE DO NOT MEET THE FEMA BFE DETAILED HEREIN, THE CONTRACTOR SHALL RECONSTRUCT THE BULKHEAD AS REQUIRED TO MEET THE FEMA BFE AT NO ADDITIONAL COST THE OWNER OR ENGINEER - ITEM 27.

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MARK	DATE	DESCRIPTION	BY
	08/08/19	100% BID DOCUMENTS	ATC

CITY OF LONG BEACH

NORTH SHORE BULKHEAD PROJECT

GENERAL NOTES

PROJ:	200-01298-16007
DESN:	JDA
DRWN:	AMB
CHKD:	JO

G-002

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LEGEND

Manholes

- Communications
- Drain
- Electric
- Fiber Optic
- Fire Department
- Gas
- Water High Temperature Hot
- Record Only
- Sewer
- Sewer - Drop — COMB — DIAMETER MATERIAL DEPTH
- Sewer Cleanout
- Traffic
- Telephone
- Unknown
- Water

Utility Hardware

- Electric Pullbox — EB
- Electric Vault — E
- Gas Main Valve
- Gas Marker — GM
- Gas Meter — G
- Gas Service Valve — G
- Gas Test Station — G TEST
- Gas Vent — G
- Hydrant
- Hydrant Valve
- Irrigation Valve
- Monitoring Well
- Oil Filler Valve — TV
- Pole Riser - Electric — EL
- Pole Riser - Telephone — T
- Pole Riser - T.V. — TV
- Pole Riser - Traffic — TR
- Roof Drain — RD
- Sewer Vent — S
- Stand Pipe
- Traffic Detector
- Traffic Loop
- Unidentified Vault — V
- Unknown Valve
- Unknown Pullbox
- Water Main Valve
- Water Meter — M
- Water Service Valve — W

Utility Poles

- Guy Wire and Ancor
- Light Pole Base
- Metal Pole with Light — L, LF, LP, LT, LP,T
- Metal Pole with Traffic — L
- Pedestrian Signal — P
- Wooden Utility Pole — U, UF, UP, UT, UP,T
- Wooden Utility Pole with Light — U, UF, UP, UT, UP,T

Utility Pole Abbreviations

F	Fire Box
P	Pedestrian Signal
T	Traffic

Utility Lines and Paint Marks

- Dead End
- End of Information
- Automated Vacuum
- Cable — TV
- Drain — ?' D
- Electric — Electric
- Electric Offset — Electric
- Fiber Optic — Fiber
- Fire — Fire
- Gas — Gas
- Gas offset — Gas
- Gas Service — Gas
- Oil — Oil
- Overhead
- Sewer — ?' S
- Sewer (24" Or Greater) — ?' S
- Sewer House Connection — SHC 6.1' Cov.
- Steam
- Street Lighting
- Telephone — Telephone
- Telephone Offset — Telephone
- Traffic — Traffic
- Unknown Utility
- Water — ?' Water
- Water (24" Or Greater) — ?' Water
- Water Offset — ?' Water
- Water Service
- Water Chilled — Chilled Water
- Water High Temperature Hot

Fences

- Guard Rail
- Chain Link Fence — X
- Wooden Fence — //
- Metal Fence
- Retaining Wall
- Vinyl Fence

Miscellaneous

- Aerial Target
- Baseline & Station — 0+00, 1+00
- Basketball Backboard Post — BB
- Bench — B
- Benchmark
- Bike Rack
- Boring
- Bulkhead
- Bulkhead w/ Wale & Anchors
- Cellar Door — CE
- Column
- Communications Pullbox — C
- Communications Box - Round
- Curb - Concrete
- Curb - Belgian Block
- Curb - Brick
- Curb & Gutter
- Edge Of Pavement
- First Floor Entrance
- Flagpole — FP
- Fountain
- Garage Entrance
- Grill — BBQ
- Guardpost — GP
- Handicap Ramp
- Inlet Protection
- Mailbox — MB
- Material Change
- Major Contour — 5
- Minor Contour — 2
- Multi-Meter — MM
- Parking Meter
- Piling
- Police Box — P
- Sign - Single Post
- Sign - Double Post
- Steps
- Sprinkler (underground) — SPLR
- Telephone Booth — TB
- Test Hole
- Traffic Control Cabinet — TC
- Trash Can
- Turnstile — TS
- WiFi
- Yard Light

Property Markers

- Cross Cut
- Drill Hole
- Disk
- Iron Pipe
- Iron Rod/ Rebar/ Pin
- L Cut — L
- Misc. Marker
- Monument
- Monument - Not Found
- PK/Mag Nail
- Railroad Spike
- Spike
- Stake

Property Lines

- ROW Line
- Lot Lines

Vegetation

- Bush
- Hedge
- Tree (with Size) Located At Center — ?"
- Tree (with Size) Located At Face — ?"
- Treeline

Northing-Easing

N= 10.187
E= 23.398

Catch Basins

- Type "A"
- Type 1
- Type 3
- Flush Grate
- Round Grate
- Small Rectangle Grate
- Square Grate

Abbreviations

Aband.	Abandoned
Alum.	Aluminum
Apt.	Apartment
Asph.	Asphalt
B.O.P.	Beginning Of Profile
B. Blk.	Belgian Block
B.T.	Blacktop
Bit.	Bituminous
Blk.	Block
Brk.	Brick
CB	Catch Basin
C.O.C.	Center Of Cable
Conc.	Concrete
Ch. Lk. Fe.	Chain Link Fence
C.L.F.	Chain Link Fence
DE	Dead End
D.I.C.B.	Double Inlet Catch Basin
Dilap.	Dilapidated
El	Elevation
EOI	End Of Information
EOP	End Of Profile
Exist.	Existing
FF=7.25	First Floor Elevation
Fr.	Frame
GF=18.30	Garage Floor Elevation
I=1.6	Invert Elevation
Inv.	Invert Elevation
L.	Left
L/C	Left Curb
MH	Manhole
PC	Point Of Curvature
Rail Fe.	Post And Rail Fence
Rec.	Record
#107	Residence No. 107
R.	Right
R/C	Right Curb
R=32.65	Rim Elevation Of Manhole
Rim	Rim Elevation Of Manhole
Sew.	Sewer
S.I.C.B.	Single Inlet Catch Basin
SSHC	Sanitary Sewer House Connection
Slt.	Slate
Sta.	Station
Stock. Fe.	Stockade Fence
Sty.	Story
T/G	Top Of Gutter
Th #3	Test Hole
TOP	Top Of Pipe
TW	Top Of Wall
Typ.	Typical
U.G.	Underground
Vac.	Vacant
VPI	Vertical Point Of Intersection
Wd.	Wood

Pipe Material Abbreviations

ACPP	Asbestos Cement Pressure Pipe
ACP	Asbestos Cement Pipe
CI	Cast Iron
CIBS	Cast Iron Bare Steel
CLDI	Cement Lined Ductile Iron
CLMP	Cement Lined Metal Pipe
CMP	Corrugated Metal Pipe
CP	Clay Pipe
CPP	Corrugated Polyethylene Pipe
CS	Carbon Steel
DB	Double Barrel
DI	Ductile Iron
ESVP	Extra Strength Vitrified Pipe
FTRC	Flat Top Reinforced Concrete
FRP	Fiberglass Reinforced Pipe
HERCP	Horizontal Elliptical Reinforced Concrete Pipe
HDPP	High Density Polyethylene Pipe
PE	Polyethylene
PRCP	Precast Reinforced Concrete Pipe
PVC	Polyvinyl Chloride Pipe
RCP	Reinforced Concrete Pipe
SS	Stainless Steel
ST	Steel
VCP	Vitrified Clay Pipe

Directional Abbreviations

(E)	East
(N)	North
(NE)	North East
(NW)	North West
(S)	South
(SE)	South East
(SW)	South West
(W)	West
E/S	East Side
N/S	North Side
S/S	South Side
W/S	West Side

TETRA TECH
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NEW YORK, NEW YORK 10004
PHONE: (646) 576-4034

STATE OF NEW YORK — ANDREW TODD COATS — 094869-1 — LICENSED PROFESSIONAL ENGINEER
ANDREW TODD COATS

MARK	DATE	DESCRIPTION	BY
	08/08/19	100% BID DOCUMENTS	ATC

CITY OF LONG BEACH
NORTH SHORE BULKHEAD PROJECT

LEGEND

PROJ:	200-01298-16007
DESN:	JDA
DRWN:	AMB
CHKD:	JO

G-003

Copyright: Tetra Tech

7/30/2019 1:03:29 PM - P:\01298\200-01298-16007\CAD\MODELFILES\100% DESIGN DRAWINGS\G-002 GENERAL NOTES.DWG - BATHAN, ANDREW

DESIGN CRITERIA

A. SOIL PARAMETERS: DESIGNS BASED ON A TOTAL SOIL UNIT WEIGHT OF 120 PSF, COHESION OF 0 PSI, AND A FRICTION ANGLE OF 31 DEGREES.

B. SEAWATER PARAMETERS (NAVD 88 ELEVATIONS):

BASE FLOOD ELEVATION (STREET DEAD ENDS)	= 10.0'
BASE FLOOD ELEVATION (W. BAY DRIVE AND CANALS)	= 9.0'
MEAN HIGHER HIGH WATER	= 2.34'
MEAN SEA LEVEL	= -0.12'
MEAN LOWER LOW WATER	= -2.55'

C. HELICAL ANCHORS
HELICAL ANCHORS TO BE TYPE SS5 SQUARE SHAFT, 1.5-INCH SQUARE, GALV (G90) AS MANUFACTURED BY CHANCE OR APPROVED EQUAL. THE LEAD SECTION TO BE 5.5FT LONG (CATALOG NO. 012642AEJ). THE EXTENSION TO BE 16FT LONG (CATALOG NO. 12658

SERIAL NUMBER	SHEET PILE SCHEDULE									ANCHOR SHEETPILE RECOMMENDATION			ANCHOR SCHEDULE				
	LOCATION	STATION		HT. OF BULKHEAD ABOVE			RECOMMENDED SHEET	EMBEDMENT BELOW LANDSIDE GRADE (FT)	TOTAL SHEET LENGTH (FT)	EMBEDMENT LENGTH BELOW MUDLINE (FT)	TOTAL SHEET LENGTH (FT)	ANCHOR SPACING (FT)	ANCHOR DESIGN LOAD (LB)	ANCHOR LENGTH (FT)	MINIMUM INSTALLATION TORQUE (FT-LB)	REMARKS	TYPE
		FROM	TO	EXIST GRADE (FT)	MUDLINE (FT)	RETAINED SOIL HT. (FT)											
1	OHIO AVE	N/A	34	4	12	8	EVERCOMP 47.5 FRP	N/A	N/A	7	19	6	13,500	22	2,900	SEE NOTE 1	TYPE 2
2	CONNECTICUT AVE	N/A	48	6	10	4	EVERCOMP 47.5 FRP	18	24	N/A	N/A	N/A	N/A	N/A	N/A		TYPE 1
3	GEORGIA AVE	N/A	51	6	10	4	EVERCOMP 47.5 FRP	18	24	N/A	N/A	N/A	N/A	N/A	N/A		TYPE 1
4	INDIANA AVE	N/A	49	5	11	6	EVERCOMP 47.5 FRP	22	27	N/A	N/A	N/A	N/A	N/A	N/A		TYPE 1
5	MARYLAND AVE	N/A	46	5	12	7	EVERCOMP 47.5 FRP	N/A	N/A	7	19	6	13,500	22	2,900	SEE NOTE 1	TYPE 2
6	MINNESOTA AVE	N/A	49	5	13	8	EVERCOMP 47.5 FRP	N/A	N/A	7	20	6	13,500	22	2,900	SEE NOTE 1	TYPE 2
7	TENNESSEE AVE	N/A	53	6	13	7	EVERCOMP 47.5 FRP	N/A	N/A	7	20	6	13,500	22	2,900	SEE NOTE 1	TYPE 2
8	VIRGINIA AVE	N/A	51	6	14	8	EVERCOMP 47.5 FRP	N/A	N/A	7	21	6	13,500	22	2,900	SEE NOTE 1	TYPE 2
9	WYOMING AVE	N/A	56	5	15	10	EVERCOMP 47.5 FRP	N/A	N/A	8	23	5	15,400	22	3,100	SEE NOTE 1	TYPE 2
10	DELAWARE AVE	N/A	58	6	15	9	EVERCOMP 47.5 FRP	N/A	N/A	8	23	5	15,400	22	3,100	SEE NOTE 1	TYPE 2
11	ARIZONA AVE	N/A	66	5	15	10	EVERCOMP 47.5 FRP	N/A	N/A	8	23	5	15,400	22	3,100	SEE NOTE 1	TYPE 2
12	PENNSYLVANIA AVE	N/A	41	7	10	3	EVERCOMP 47.5 FRP	16	23	N/A	N/A	N/A	N/A	N/A	N/A		TYPE 1
13	LINDELL BLVD	N/A	91	5	15	10	EVERCOMP 47.5 FRP	N/A	N/A	8	23	5	15,400	22	3,100	SEE NOTE 1	TYPE 2
	DOYLE STREET (SOUTH OF EAST PINE STREET)	0+00	0+50	3	11	8	EVERCOMP 80.5 FRP	24	27	N/A	N/A	N/A	N/A	N/A	N/A		TYPE 4
		0+50	1+00	3	12.5	9.5	EVERCOMP 80.5 FRP	N/A	N/A	8	21	5	15,400	22	3,100	SEE NOTE 2	TYPE 3
		1+00	1+50	4	12.5	8.5	EVERCOMP 80.5 FRP	N/A	N/A	8	21	5	15,400	22	3,100		
		1+50	2+00	4	13	9	EVERCOMP 80.5 FRP	N/A	N/A	8	21	5	15,400	22	3,100		
		2+00	2+50	4	13	9	EVERCOMP 80.5 FRP	N/A	N/A	8	21	5	15,400	22	3,100		
		2+50	3+00	4.5	14	9.5	EVERCOMP 80.5 FRP	N/A	N/A	8	22	5	15,400	22	3,100		
		3+00	3+50	4.5	13.5	9	EVERCOMP 80.5 FRP	N/A	N/A	8	22	5	15,400	22	3,100		
		3+50	4+00	3	14	11	EVERCOMP 80.5 FRP	N/A	N/A	9	23	5	17,900	22	3,600		
		4+00	4+50	4.5	14.5	10	EVERCOMP 80.5 FRP	N/A	N/A	8	23	5	15,400	22	3,100		
		4+50	5+00	5.5	16	10.5	EVERCOMP 80.5 FRP	N/A	N/A	9	25	5	17,900	22	3,600		
		5+00	5+50	5.5	15.5	10	EVERCOMP 80.5 FRP	N/A	N/A	8	24	5	15,400	22	3,100		
		5+50	6+00	5.5	16	10.5	EVERCOMP 80.5 FRP	N/A	N/A	9	25	5	17,900	22	3,600		
		6+00	6+50	5.5	15	9.5	EVERCOMP 80.5 FRP	N/A	N/A	8	23	5	15,400	22	3,100		
		6+50	7+00	6	15	9	EVERCOMP 80.5 FRP	N/A	N/A	8	23	5	15,400	22	3,100		
		7+00	7+50	5	14	9	EVERCOMP 80.5 FRP	N/A	N/A	8	22	5	15,400	22	3,100		
		7+50	8+00	4.5	15	10.5	EVERCOMP 80.5 FRP	N/A	N/A	9	24	5	17,900	22	3,600		
		8+00	8+50	4.5	14	9.5	EVERCOMP 80.5 FRP	N/A	N/A	8	22	5	15,400	22	3,100		
		8+50	9+00	4.5	13	8.5	EVERCOMP 80.5 FRP	N/A	N/A	8	21	5	15,400	22	3,100		
		9+00	9+50	4	13.5	9.5	EVERCOMP 80.5 FRP	N/A	N/A	8	22	5	15,400	22	3,100		
		9+50	10+00	5	14	9	EVERCOMP 80.5 FRP	N/A	N/A	8	22	5	15400	22	3,100		
		10+00		2	14	12	EVERCOMP 80.5 FRP	N/A	N/A	9	23	5	17,900	22	3,600		
	DOYLE STREET (NORTH OF EAST PINE STREET)	0+00	0+50	3	14	11	EVERCOMP 80.5 FRP	N/A	N/A	9	23	5	17,900	22	3,600		
		0+50	1+00	4.5	15	10.5	EVERCOMP 80.5 FRP	N/A	N/A	9	24	5	17,900	22	3,600		
		1+00	1+50	4.5	14.5	10	EVERCOMP 80.5 FRP	N/A	N/A	8	23	5	15,400	22	3,100		
		1+50	2+00	5	15	10	EVERCOMP 80.5 FRP	N/A	N/A	8	23	5	15,400	22	3,100		
		2+00	2+50	5.5	15	9.5	EVERCOMP 80.5 FRP	N/A	N/A	8	23	5	15,400	22	3,100		
		2+50	3+00	5	14.5	9.5	EVERCOMP 80.5 FRP	N/A	N/A	8	23	5	15,400	22	3,100		
		3+00	3+50	5	14.5	9.5	EVERCOMP 80.5 FRP	N/A	N/A	8	23	5	15,400	22	3,100		
		3+50	4+00	5	14	9	EVERCOMP 80.5 FRP	N/A	N/A	8	22	5	15,400	22	3,100		
		4+00	4+50	5	14	9	EVERCOMP 80.5 FRP	N/A	N/A	8	22	5	15,400	22	3,100		
		4+50	5+00	5.5	14	8.5	EVERCOMP 80.5 FRP	N/A	N/A	8	22	5	15,400	22	3,100		
		5+00	5+50	5.5	14.5	9	EVERCOMP 80.5 FRP	N/A	N/A	8	23	5	15,400	22	3,100		
		5+50	6+00	5.5	14	8.5	EVERCOMP 80.5 FRP	N/A	N/A	8	22	5	15,400	22	3,100		
		6+00	6+50	5.5	15	9.5	EVERCOMP 80.5 FRP	N/A	N/A	8	23	5	15,400	22	3,100		
		6+50	7+00	5.5	13.5	8	EVERCOMP 80.5 FRP	24	30	N/A	N/A	N/A	N/A	N/A	N/A		TYPE 4
		7+00	7+18	5	13	8	EVERCOMP 80.5 FRP	24	29	N/A	N/A	N/A	N/A	N/A	N/A		TYPE 4
		7+18		5	13	8	EVERCOMP 80.5 FRP	24	29	N/A	N/A	N/A	N/A	N/A	N/A		TYPE 4
	HERON STREET (SOUTH OF EAST PINE STREET)	0+00	0+50	3.5	12	8.5	EVERCOMP 80.5 FRP	N/A	N/A	8	20	5	15,400	22	3,100	SEE NOTE 2	TYPE 3
		0+50	1+00	4	13	9	EVERCOMP 80.5 FRP	N/A	N/A	8	21	5	15,400	22	3,100	SEE NOTE 2	TYPE 3
		1+00	1+50	4	12.5	8.5	EVERCOMP 80.5 FRP	N/A	N/A	8	21	5	15,400	22	3,100	SEE NOTE 2	TYPE 3
		1+50	2+00	4	12.5	8.5	EVERCOMP 80.5 FRP	N/A	N/A	8	21	5	15,400	22	3,100	SEE NOTE 2	TYPE 3
		2+00	2+50	5	12.5	7.5	EVERCOMP 80.5 FRP	24	29	N/A	N/A	N/A	N/A	N/A	N/A		TYPE 4
		2+50	3+00	5	13	8	EVERCOMP 80.5 FRP	24	29	N/A	N/A	N/A	N/A	N/A	N/A		
		3+00	3+50	5	13	8	EVERCOMP 80.5 FRP	24	29	N/A	N/A	N/A	N/A	N/A	N/A		
		3+50	4+00	5	13	8	EVERCOMP 80.5 FRP	24	29	N/A	N/A	N/A	N/A	N/A	N/A		
		4+00	4+50	5	13	8	EVERCOMP 80.5 FRP	24	29	N/A	N/A	N/A	N/A	N/A	N/A		
		4+50	5+00	5	13.5	8.5	EVERCOMP 80.5 FRP	N/A	N/A	8	22	5	15,400	22	3,100	SEE NOTE 2	TYPE 3
		5+00	5+50	5	14.5	9.5	EVERCOMP 80.5 FRP	N/A	N/A	8	23	5	15,400	22	3,100		
		5+50	6+00	4.5	14	9.5	EVERCOMP 80.5 FRP	N/A	N/A	8	22	5	15,400	22	3,100		
		6+00	6+50	5	15.5	10.5	EVERCOMP 80.5 FRP	N/A	N/A	9	25	5	17,900	22	3,600		
		6+50	7+00	5	13.5	8.5	EVERCOMP 80.5 FRP	N/A	N/A	8	22	5	15,400	22	3,100		
		7+00	7+50	4.5	15	10.5	EVERCOMP 80.5 FRP	N/A	N/A	9	24	5	17,900	22	3,600		
		7+50	8+00	5	14.5	9.5	EVERCOMP 80.5 FRP	N/A	N/A	8	23	5	15,400	22	3,100		
		8+00	8+50	5.5	14.5	9	EVERCOMP 80.5 FRP	N/A	N/A	8	23	5	15,400	22	3,100		
		8+50	9+00	5	14	9	EVERCOMP 80.5 FRP	N/A	N/A	8	22	5	15,400	22	3,100		
		9+00	9+50	5	14	9	EVERCOMP 80.5 FRP	N/A	N/A	8	22	5	15,400	22	3,100		
		9+50	9+97	5	14	9	EVERCOMP 80.5 FRP	N/A	N/A	8	22	5	15,400	22	3,100		
		9+97		2	14.5	12.5	EVERCOMP 80.5 FRP	N/A	N/A	9	24	5	17,900	22	3,600		
	HERON STREET (NORTH OF EAST PINE STREET)	0+00	0+50	2	14	12	EVERCOMP 80.5 FRP	N/A	N/A	9	23	5	17,900	22	3,600		
		0+50	1+00	4.5	14.5	10	EVERCOMP 80.5 FRP	N/A	N/A	8	23	5	15,400	22	3,100		
		1+00	1+50	5	14	9	EVERCOMP 80.5 FRP	N/A	N/A	8	22	5	15,400	22	3,100		
		1+50	2+00	5	13.5	8.5	EVERCOMP 80.5 FRP	N/A	N/A	8	22	5	15,400	22	3,100		
		2+00	2+50	5	13.5	8.5	EVERCOMP 80.5 FRP	N/A	N/A	8	22	5	15,400	22	3,100		
		2+50	3+00	5.5	13.5	8	EVERCOMP 80.5 FRP	24	30	N/A	N/A	N/A	N/A	N/A	N/A		TYPE 4
		3+00	3+50	5.5	14	8.5	EVERCOMP 80.5 FRP	N/A	N/A	8	22	5	15,400	22	3,100	SEE NOTE 2	TYPE 3
		3+50	4+00	5	13.5	8.5	EVERCOMP 80.5 FRP	N/A	N/A	8	22	5	15,400	22	3,100	SEE NOTE 2	TYPE 3
		4+00	4+50	6	14	8	EVERCOMP 80.5 FRP	24	30	N/A	N/A	N/A	N/A	N/A	N/A		TYPE 4
		4+50	5+00	6	14	8	EVERCOMP 80.5 FRP	24	30	N/A	N/A	N/A	N/A	N/A	N/A		TYPE 4
		5+00	5+50	5.5	14	8.5	EVERCOMP 80.5 FRP	N/A	N/A	8	22	5	15,400	22	3,100	SEE NOTE 2	TYPE 3
		5+50	6+00	6	15	9	EVERCOMP 80.5 FRP	N/A	N/A	8	23	5	15,400	22	3,100	SEE NOTE 2	TYPE 3
		6+00	6+50	6	14	8	EVERCOMP 80.5 FRP	24	30	N/A	N/A	N/A	N/A	N/A	N/A		TYPE 4
		6+50	7+00	6	13.5	7.5	EVERCOMP 80.5 FRP	24	30	N/A	N/A	N/A	N/A	N/A	N/A		TYPE 4
		7+00	7+49	5.5	13	7.5	EVERCOMP 80.5 FRP	24	30	N/A	N/A	N/A	N/A	N/A	N/A		TYPE 4
		7+49		5.5	13	7.5	EVERCOMP 80.5 FRP	24	30	N/A	N/A	N/A	N/A	N/A	N/A		TYPE 4

NOTES:

1. ANCHORED WALL MUST BE USED TO MEET PERMIT REQUIREMENTS
2. CANTILEVER WALL NOT SHOWN. FOR BULKHEADS WITH RETAINED SOIL HEIGHTS BETWEEN 8' AND 10' HIGH, THE CONTRACTOR MAY, AT HIS DISCRETION, SUBMIT DESIGN FOR A TIMBER REINFORCED, CANTILEVER SHEET PILE WALL IN LIEU OF THE ANCHORED DESIGN. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.CANTILEVER WALL NOT SHOWN. FOR BULKHEADS WITH RETAINED SOIL HEIGHTS BETWEEN 8' AND 10' HIGH, THE CONTRACTOR MAY, AT HIS DISCRETION, SUBMIT DESIGN FOR A TIMBER REINFORCED, CANTILEVER SHEET PILE WALL IN LIEU OF THE ANCHORED DESIGN. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.

TOTAL LENGTH OF BULKHEAD	
DESCRIPTION	LENGTH (LF)
TYPE 1/ ITEM 2	189
TYPE 2/ ITEM 3	504
TYPE 3/ ITEM 4	2,703
TYPE 4/ ITEM 5	761

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(646) 576-4024

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RICHARD E. CZLAPINSKI
Aug 2019

MARK	DATE	DESCRIPTION	BY
	04/12/19	100% CONSTRUCTION DOCUMENTS	ATC

CITY OF LONG BEACH
NORTH SHORE BULKHEAD PROJECT

STRUCTURAL SHEET PILE SCHEDULE

Project No.:	200-01298-16007
Designed By:	PN
Drawn By:	JKS
Checked By:	ATC

B-101

Bar Measures 1 inch

8/2/2019 3:41:37 PM C:\Users\sohan.shetty\Documents\01298-16007 North Shore Bulkheading v2017_Sohan.Shetty@tetratech.com.rvt
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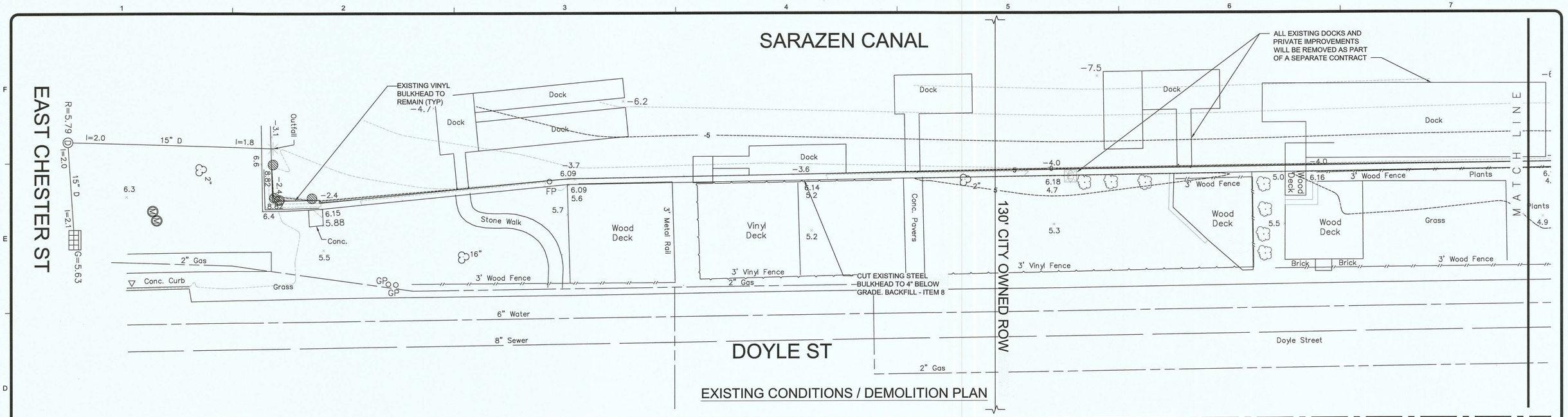
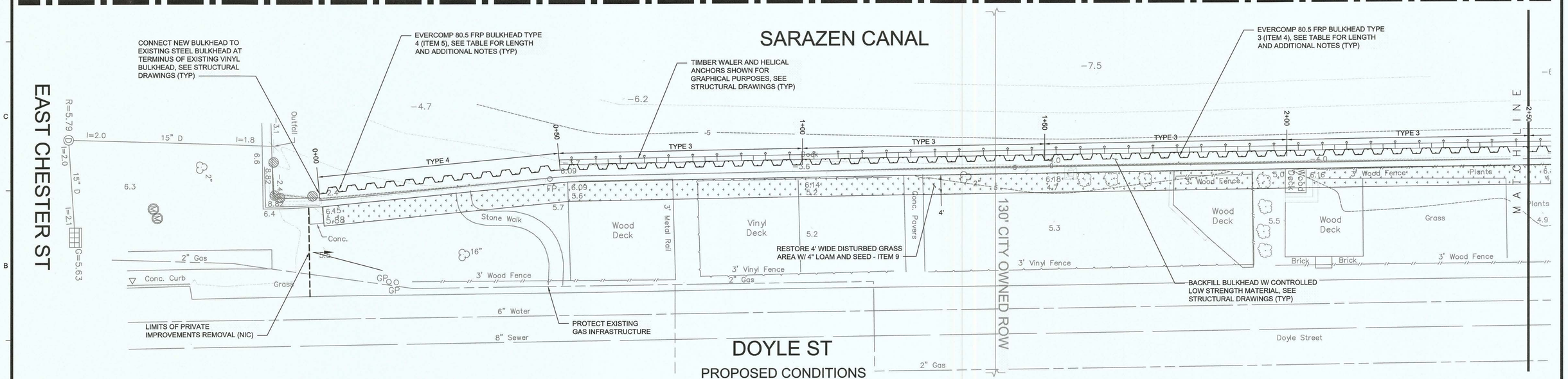


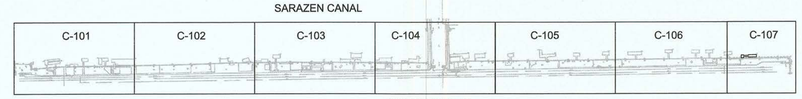
EXISTING CONDITIONS / DEMOLITION PLAN



PROPOSED CONDITIONS

PROPOSED BULKHEAD DESCRIPTIONS - DOYLE STREET			
STATION		SHEET LENGTH (FT)	HELICAL ANCHORS
START	END		
0+00	0+50	27	-
0+50	1+00	21	5' OC
1+00	1+50	21	5' OC
1+50	2+00	21	5' OC
2+00	2+50	21	5' OC

SARAZEN CANAL



DOYLE STREET

KEY MAP

SCALE: 1" = 20'

0 5 10 20

SCALE: 1" = 10'

TETRA TECH

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	08/08/19	100% BID DOCUMENTS	ATC

CITY OF LONG BEACH

NORTH SHORE BULKHEAD PROJECT

DOYLE STREET BULKHEAD

PROJ:	200-01298-16007
DESN:	JDA
DRWN:	AMB
CHKD:	JO

C-101

Bar measures 1 inch, otherwise drawing not to scale

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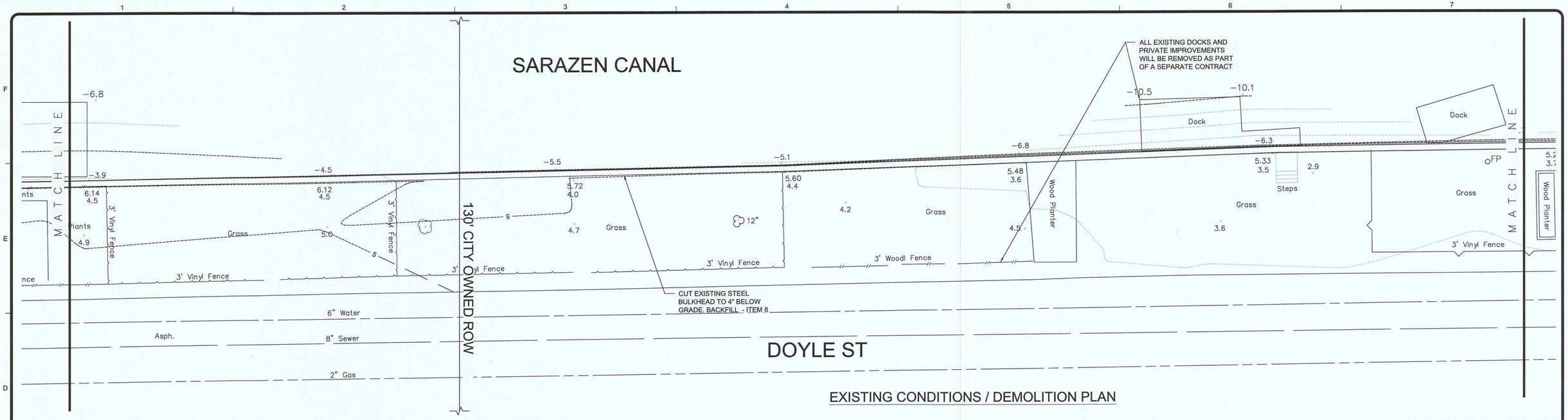
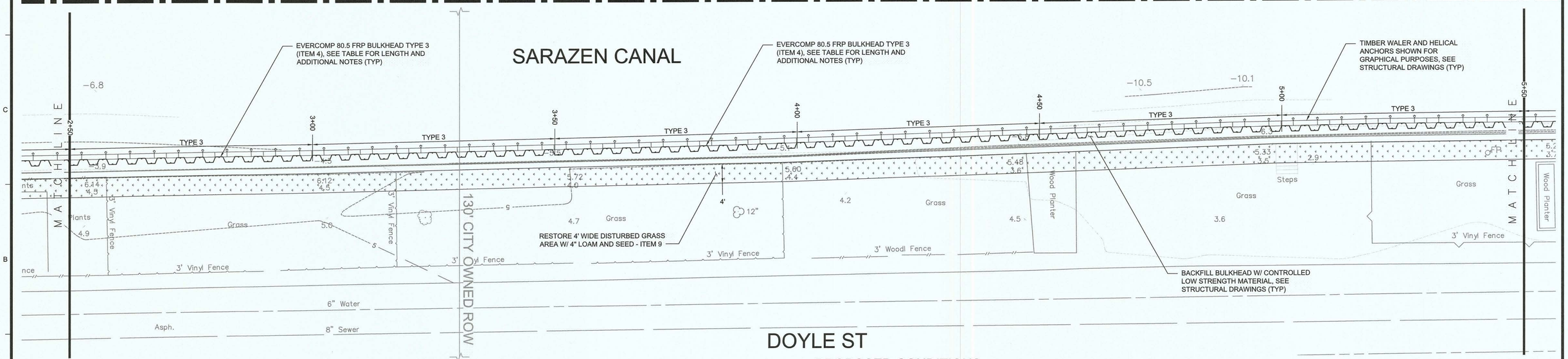


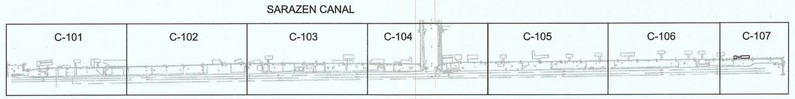
EXISTING CONDITIONS / DEMOLITION PLAN



PROPOSED CONDITIONS

PROPOSED BULKHEAD DESCRIPTIONS - DOYLE STREET			
STATION		SHEET LENGTH (FT)	HELICAL ANCHORS
START	END		
2+50	3+00	22	5' OC
3+00	3+50	22	5' OC
3+50	4+00	23	5' OC
4+00	4+50	23	5' OC
4+50	5+00	25	5' OC
5+00	5+50	24	5' OC

SARAZEN CANAL



DOYLE STREET

KEY MAP

SCALE: 1" = 20'

0 5 10 20

SCALE: 1" = 10'

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CITY OF LONG BEACH

NORTH SHORE BULKHEAD PROJECT

DOYLE STREET BULKHEAD

PROJ:	200-01298-16007
DESN:	JDA
DRWN:	AMB
CHKD:	JO

C-102

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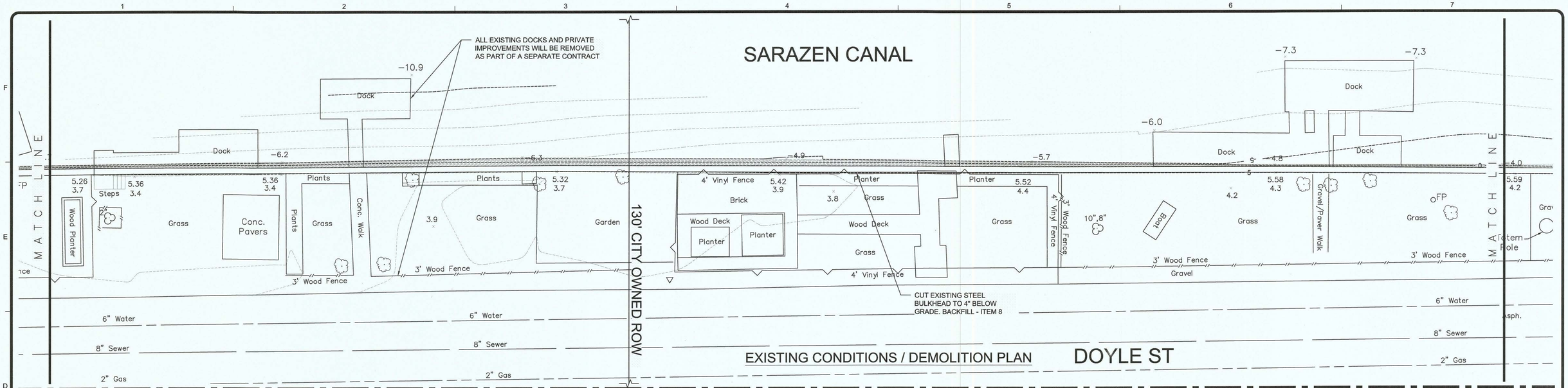
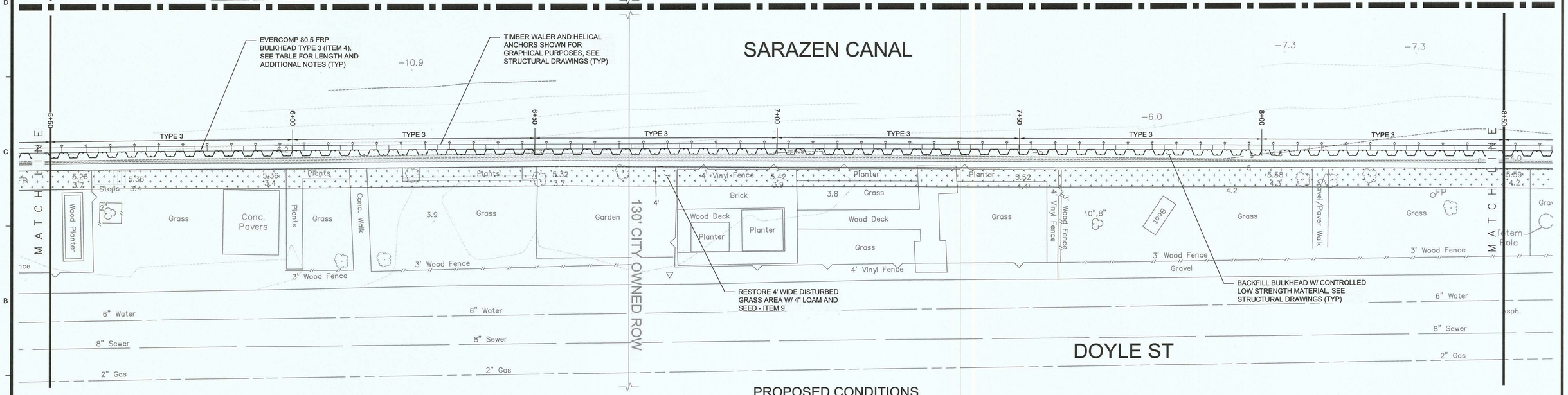
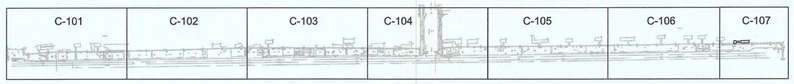




PROPOSED CONDITIONS

PROPOSED BULKHEAD DESCRIPTIONS - DOYLE STREET			
STATION		SHEET LENGTH (FT)	HELICAL ANCHORS
START	END		
5+50	6+00	25	5' OC
6+00	6+50	23	5' OC
6+50	7+00	23	5' OC
7+00	7+50	22	5' OC
7+50	8+00	24	5' OC
8+00	8+50	22	5' OC



KEY MAP

SCALE: 1" = 20'

0 5 10 20
SCALE: 1" = 10'

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CITY OF LONG BEACH
NORTH SHORE BULKHEAD PROJECT
DOYLE STREET BULKHEAD

PROJ:	200-01298-16007
DESN:	JDA
DRWN:	AMB
CHKD:	JO

C-103

Bar measures 1 inch, otherwise drawing not to scale

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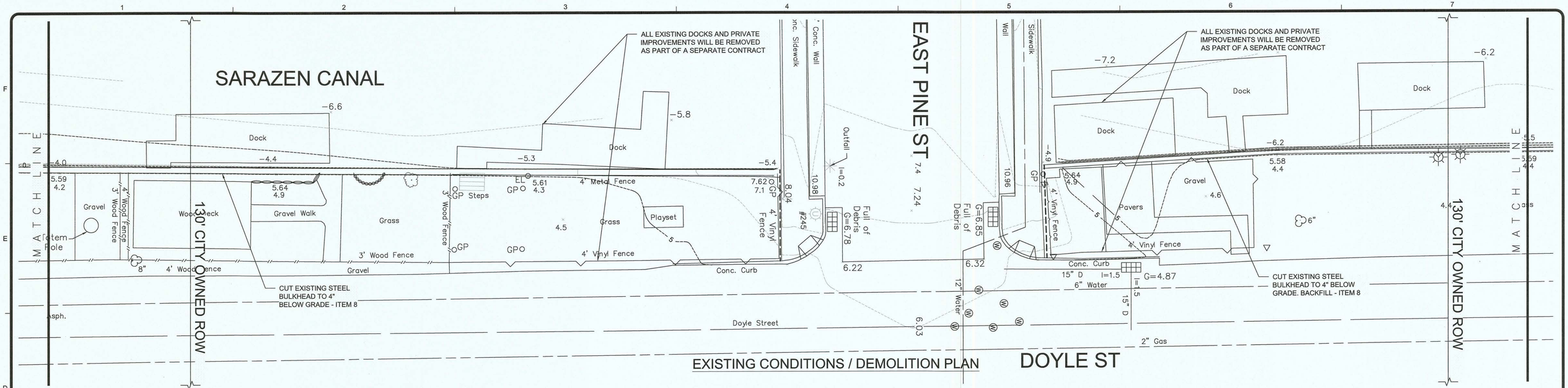
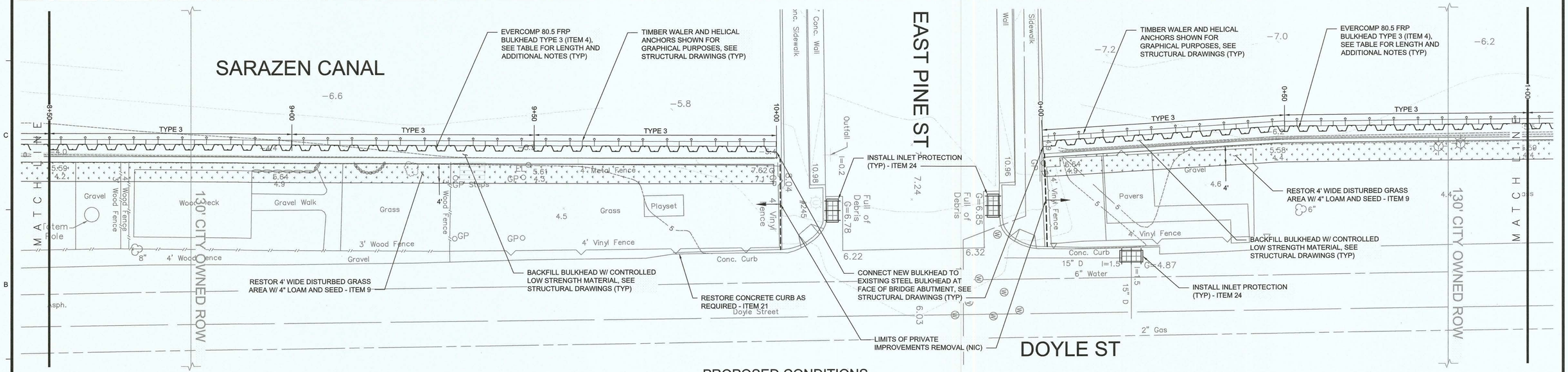


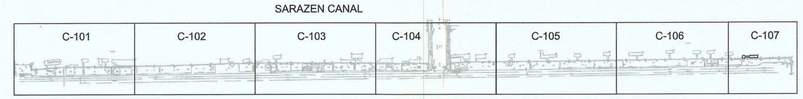
EXISTING CONDITIONS / DEMOLITION PLAN



PROPOSED CONDITIONS

PROPOSED BULKHEAD DESCRIPTIONS - DOYLE STREET			
STATION		SHEET LENGTH (FT)	HELICAL ANCHORS
START	END		
8+50	9+00	21	5' OC
9+00	9+50	22	5' OC
9+50	10+00	22	5' OC
0+00	0+50	23	5' OC
0+50	1+00	24	5' OC

SARAZEN CANAL



DOYLE STREET

KEY MAP

SCALE: 1" = 20'

0 5 10 20

SCALE: 1" = 10'

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CITY OF LONG BEACH

NORTH SHORE BULKHEAD PROJECT

DOYLE STREET BULKHEAD

PROJ:	200-01298-16007
DESN:	JDA
DRWN:	AMB
CHKD:	JO

C-104

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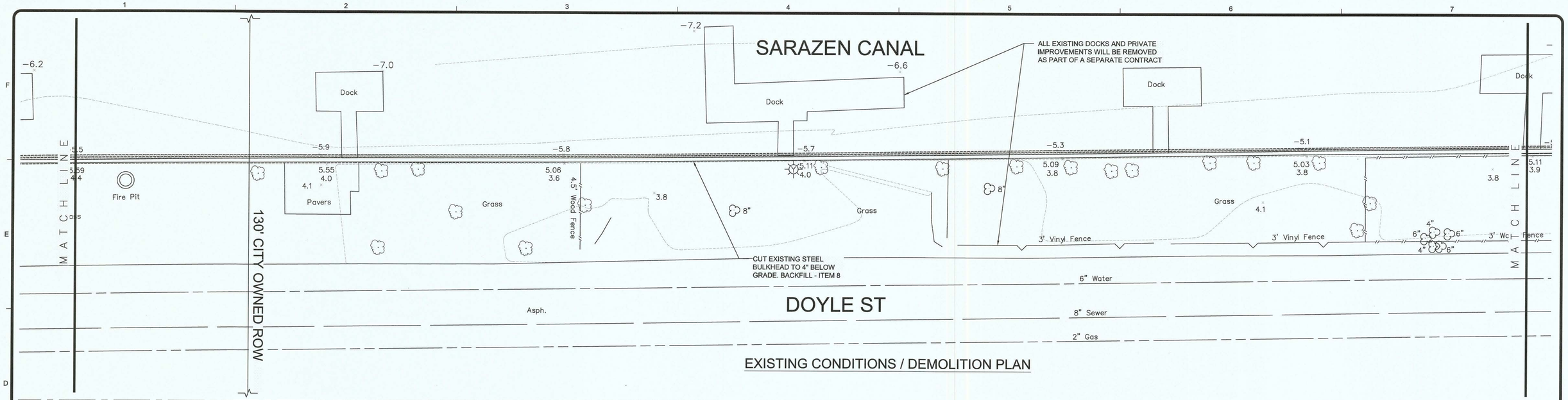
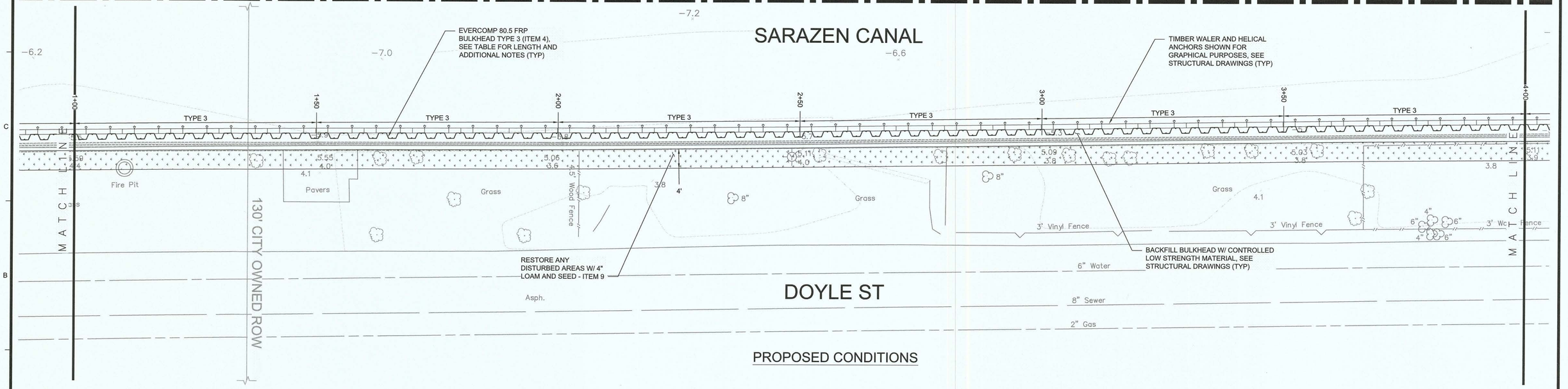


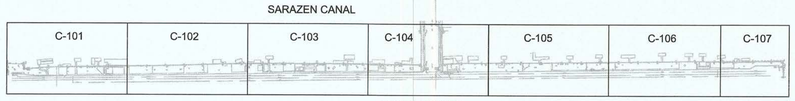
EXISTING CONDITIONS / DEMOLITION PLAN



PROPOSED CONDITIONS

PROPOSED BULKHEAD DESCRIPTIONS - DOYLE STREET			
STATION		SHEET LENGTH (FT)	HELICAL ANCHORS
START	END		
1+00	1+50	23	5' OC
1+50	2+00	23	5' OC
2+00	2+50	23	5' OC
2+50	3+00	23	5' OC
3+00	3+50	23	5' OC
3+50	4+00	22	5' OC

SARAZEN CANAL



DOYLE STREET

KEY MAP

SCALE: 1" = 20'

0 5 10 20

SCALE: 1" = 10'

N

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CITY OF LONG BEACH

NORTH SHORE BULKHEAD PROJECT

DOYLE STREET BULKHEAD

PROJ:	200-01298-16007
DESN:	JDA
DRWN:	AMB
CHKD:	JO

C-105

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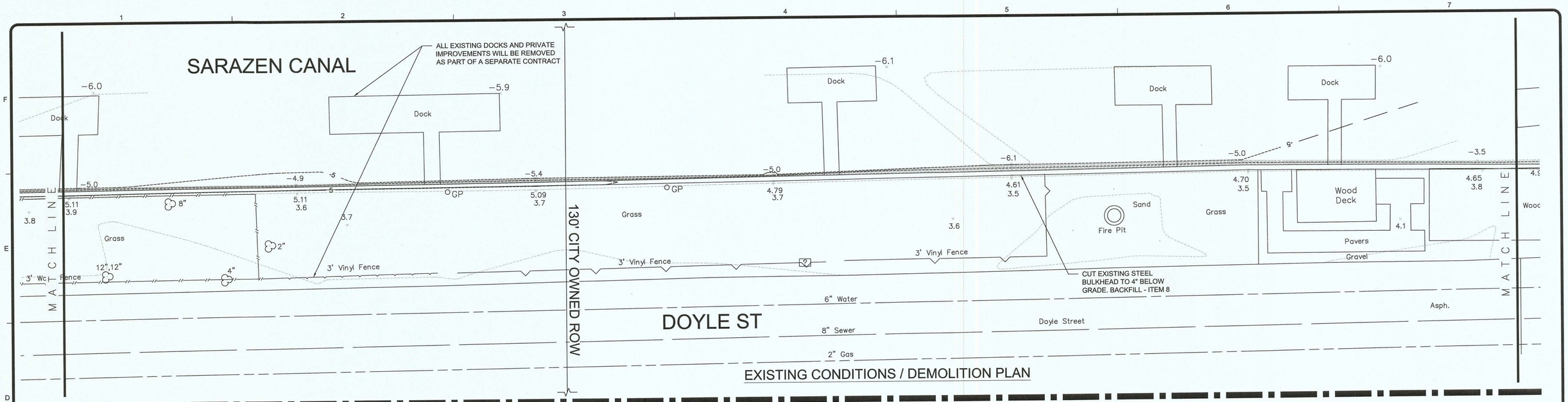
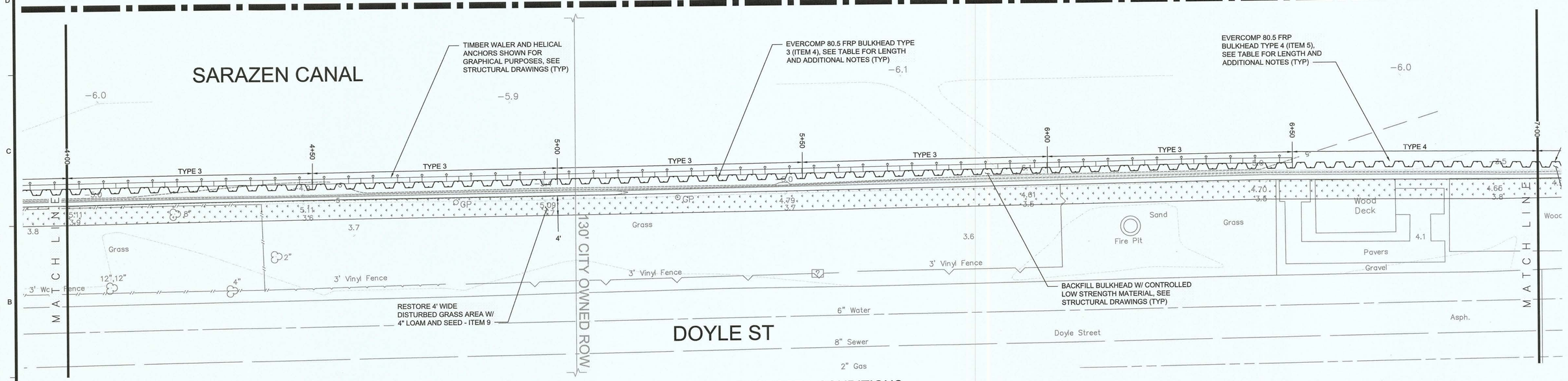


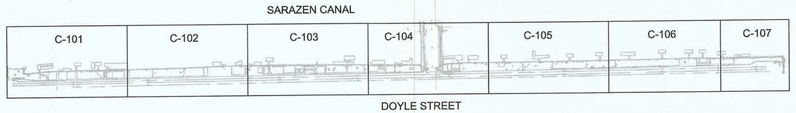
EXISTING CONDITIONS / DEMOLITION PLAN



PROPOSED CONDITIONS

PROPOSED BULKHEAD DESCRIPTIONS - DOYLE STREET			
STATION		SHEET LENGTH (FT)	HELICAL ANCHORS
START	END		
4+00	4+50	22	5' OC
4+50	5+00	22	5' OC
5+00	5+50	23	5' OC
5+50	6+00	22	5' OC
6+00	6+50	23	5' OC
6+50	7+00	30	-

SARAZEN CANAL



DOYLE STREET

KEY MAP

SCALE: 1" = 20'

0 5 10 20

SCALE: 1" = 10'

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CITY OF LONG BEACH

NORTH SHORE BULKHEAD PROJECT

DOYLE STREET BULKHEAD

PROJ:	200-01298-16007
DESN:	JDA
DRWN:	AMB
CHKD:	JO

C-106

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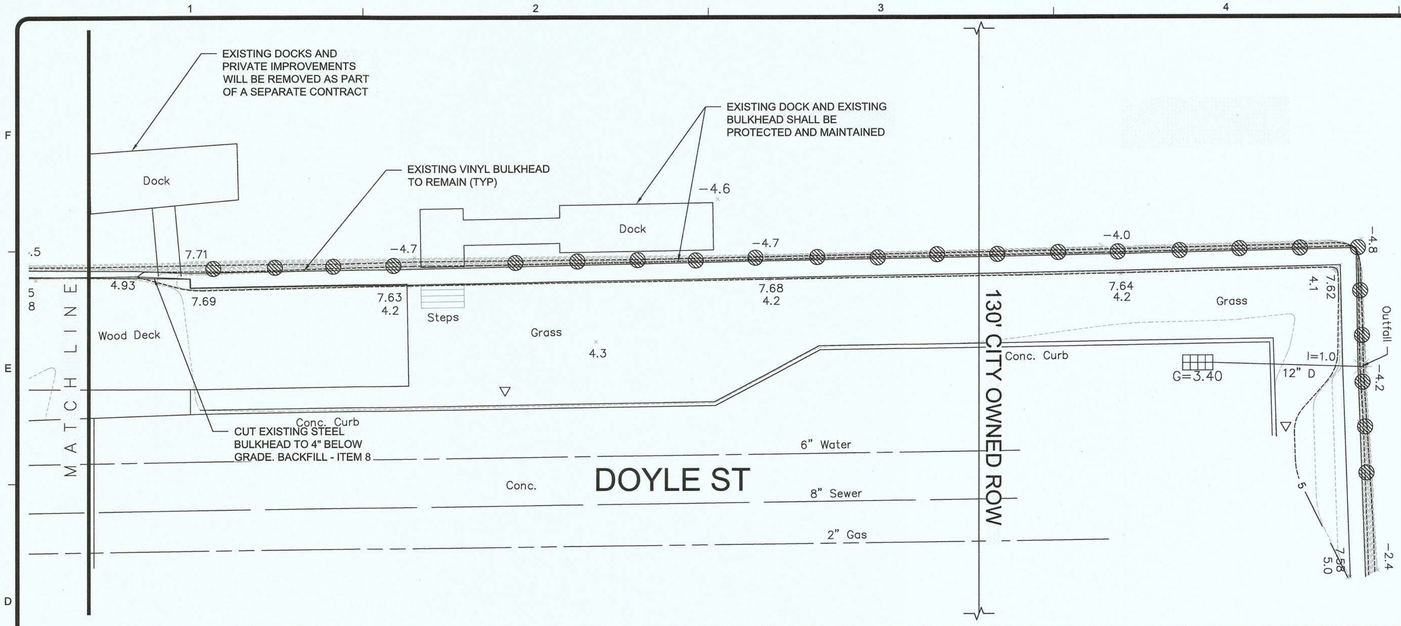
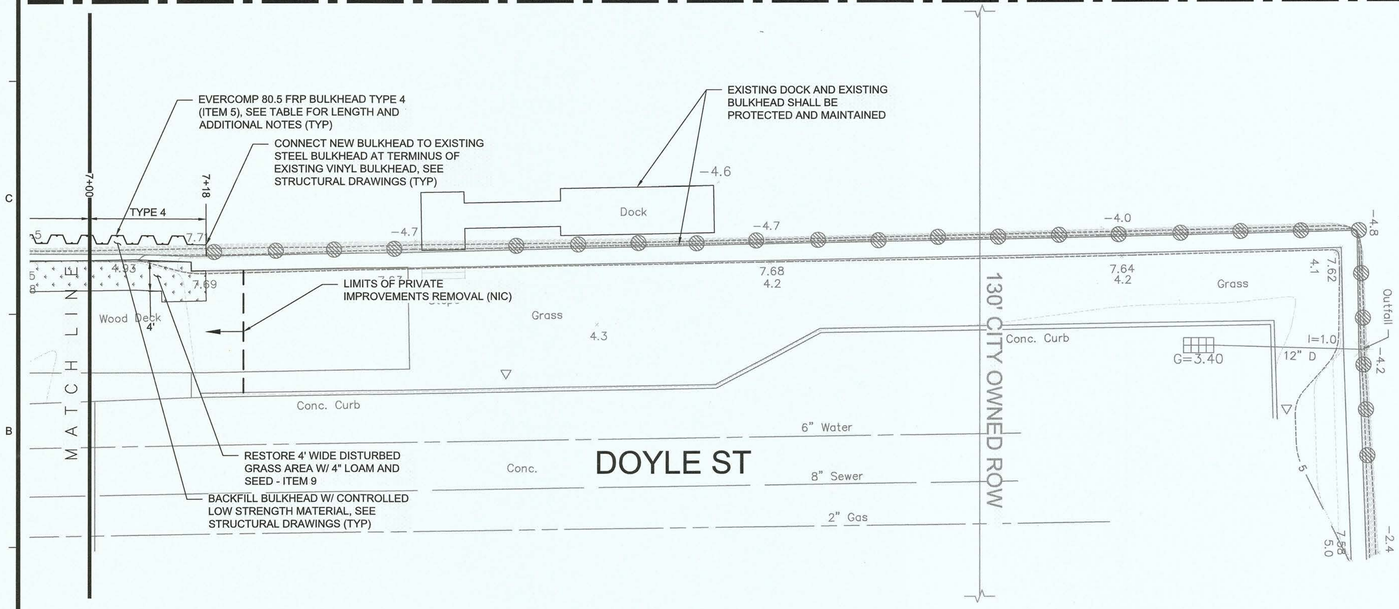


SARAZEN CANAL

EXISTING CONDITIONS / DEMOLITION PLAN



SARAZEN CANAL

PROPOSED CONDITIONS

PROPOSED BULKHEAD DESCRIPTIONS - DOYLE STREET			
STATION		SHEET LENGTH (FT)	HELICAL ANCHORS
START	END		
7+00	7+18	29	-

SARAZEN CANAL

C-101	C-102	C-103	C-104	C-105	C-106	C-107

DOYLE STREET

KEY MAP

SCALE: 1" = 20'

0 5 10 20

SCALE: 1" = 10'

TETRA TECH

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NORTH SHORE BULKHEAD PROJECT

DOYLE STREET BULKHEAD

PROJ:	200-01298-16007
DESN:	JDA
DRWN:	AMB
CHKD:	JO

C-107

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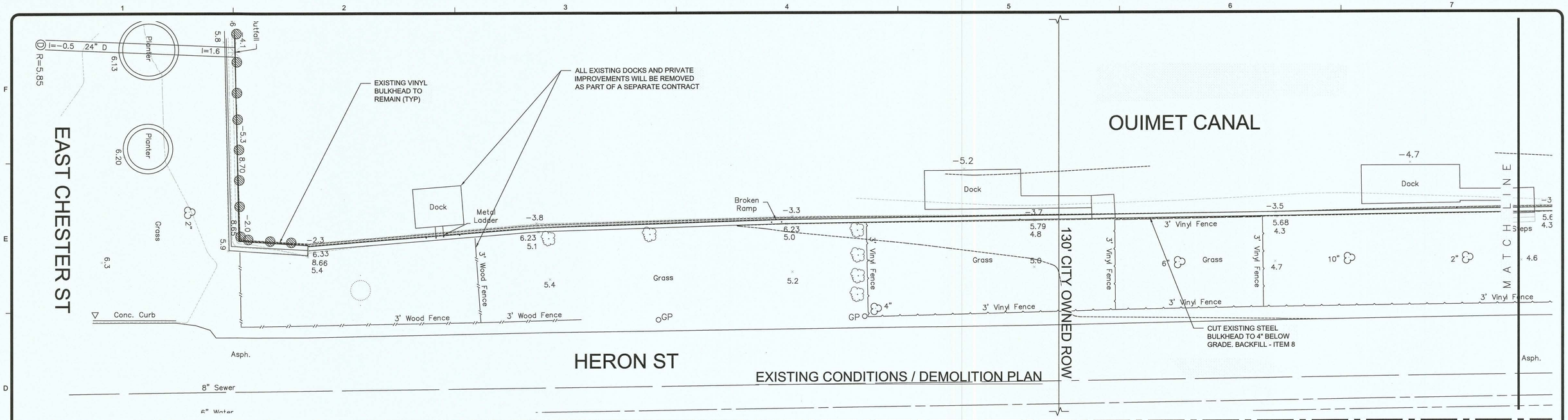
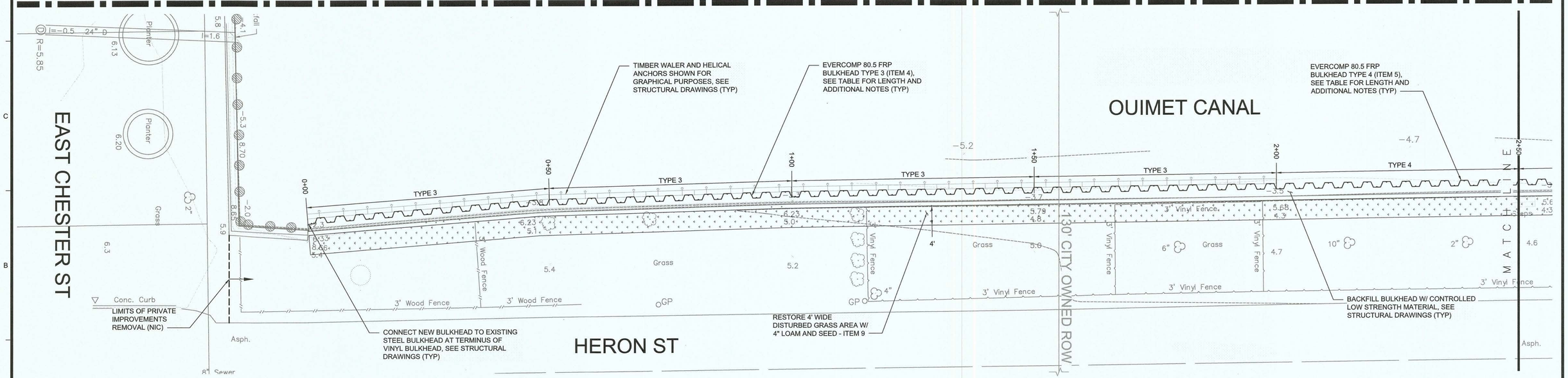
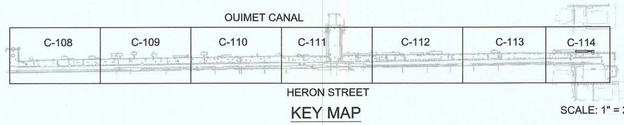


EXISTING CONDITIONS / DEMOLITION PLAN



PROPOSED CONDITIONS

PROPOSED BULKHEAD DESCRIPTIONS - HERON STREET			
STATION		SHEET LENGTH (FT)	HELICAL ANCHORS
START	END		
0+00	0+50	20	5' OC
0+50	1+00	21	5' OC
1+00	1+50	21	5' OC
1+50	2+00	21	5' OC
2+00	2+50	29	-



KEY MAP

SCALE: 1" = 20'

0 5 10 20
SCALE: 1" = 10'

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CITY OF LONG BEACH
NORTH SHORE BULKHEAD PROJECT
HERON STREET BULKHEAD

PROJ:	200-01298-16007
DESN:	JDA
DRWN:	AMB
CHKD:	JO

C-108

Copyright: Tetra Tech

Bar measures 1 inch, otherwise drawing not to scale

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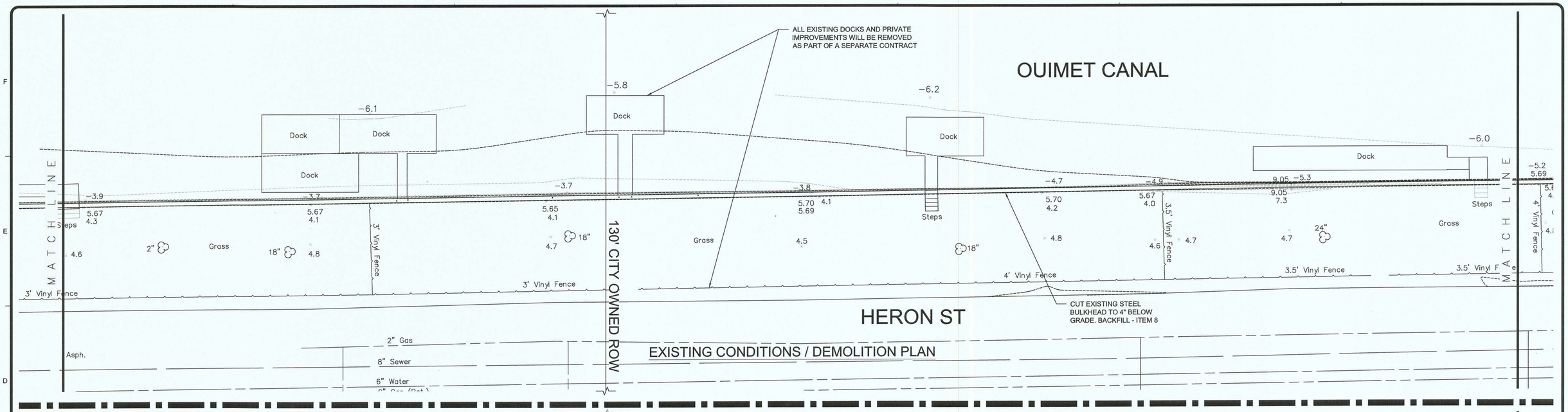
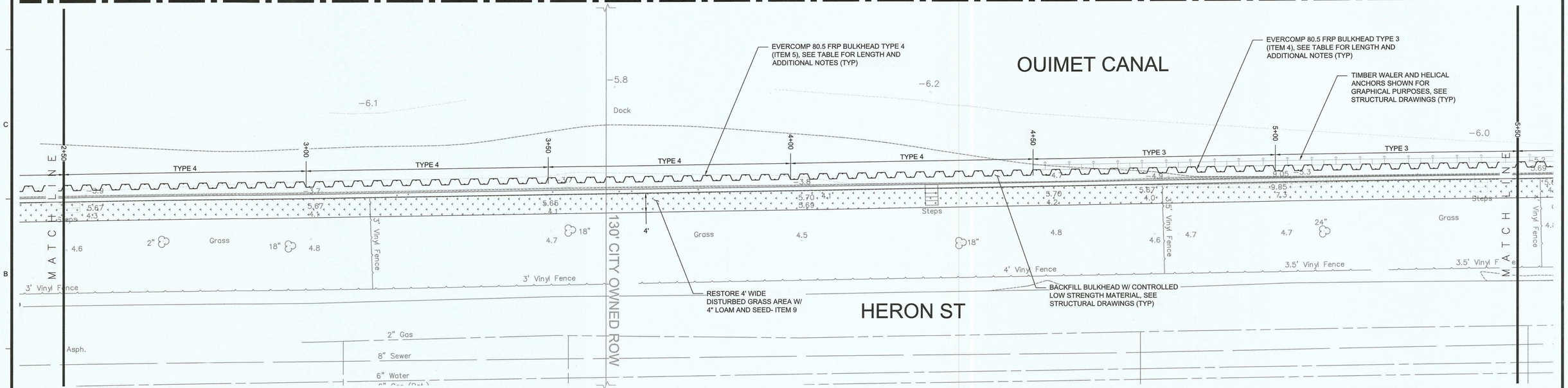
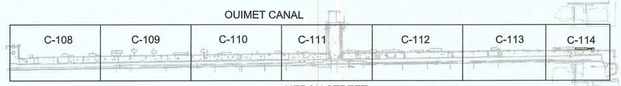


EXISTING CONDITIONS / DEMOLITION PLAN



PROPOSED CONDITIONS

PROPOSED BULKHEAD DESCRIPTIONS - HERON STREET			
STATION		SHEET LENGTH (FT)	HELICAL ANCHORS
START	END		
2+50	3+00	29	-
3+00	3+50	29	-
3+50	4+00	29	-
4+00	4+50	29	-
4+50	5+00	22	5' OC
5+00	5+50	23	5' OC



KEY MAP

SCALE: 1" = 20'

0 5 10 20

SCALE: 1" = 10'

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CITY OF LONG BEACH
NORTH SHORE BULKHEAD PROJECT

HERON STREET BULKHEAD

PROJ:	200-01298-16007
DESN:	JDA
DRWN:	AMB
CHKD:	JO

C-109

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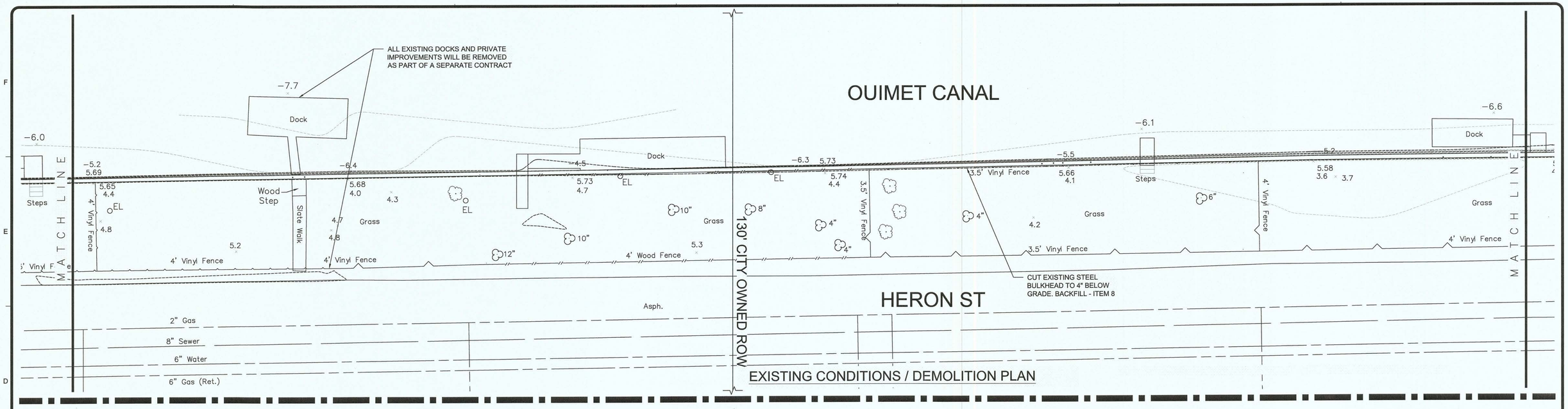
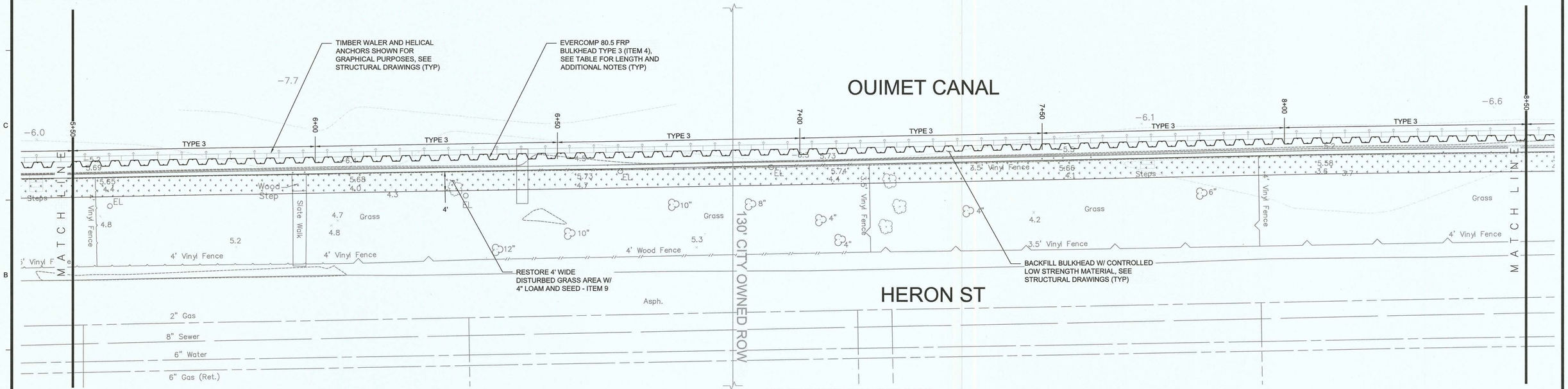
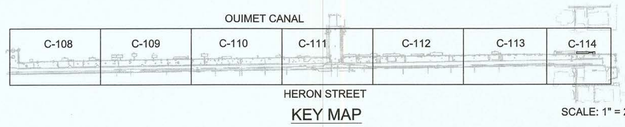




PROPOSED BULKHEAD DESCRIPTIONS - HERON STREET			
STATION		SHEET LENGTH (FT)	HELICAL ANCHORS
START	END		
5+50	6+00	22	5' OC
6+00	6+50	25	5' OC
6+50	7+00	22	5' OC
7+00	7+50	24	5' OC
7+50	8+00	23	5' OC
8+00	8+50	23	5' OC



KEY MAP

SCALE: 1" = 20'

0 5 10 20

SCALE: 1" = 10'

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	08/08/19	100% BID DOCUMENTS	ATC

CITY OF LONG BEACH

NORTH SHORE BULKHEAD PROJECT

HERON STREET BULKHEAD

PROJ:	200-01298-16007
DESN:	JDA
DRWN:	AMB
CHKD:	JO

C-110

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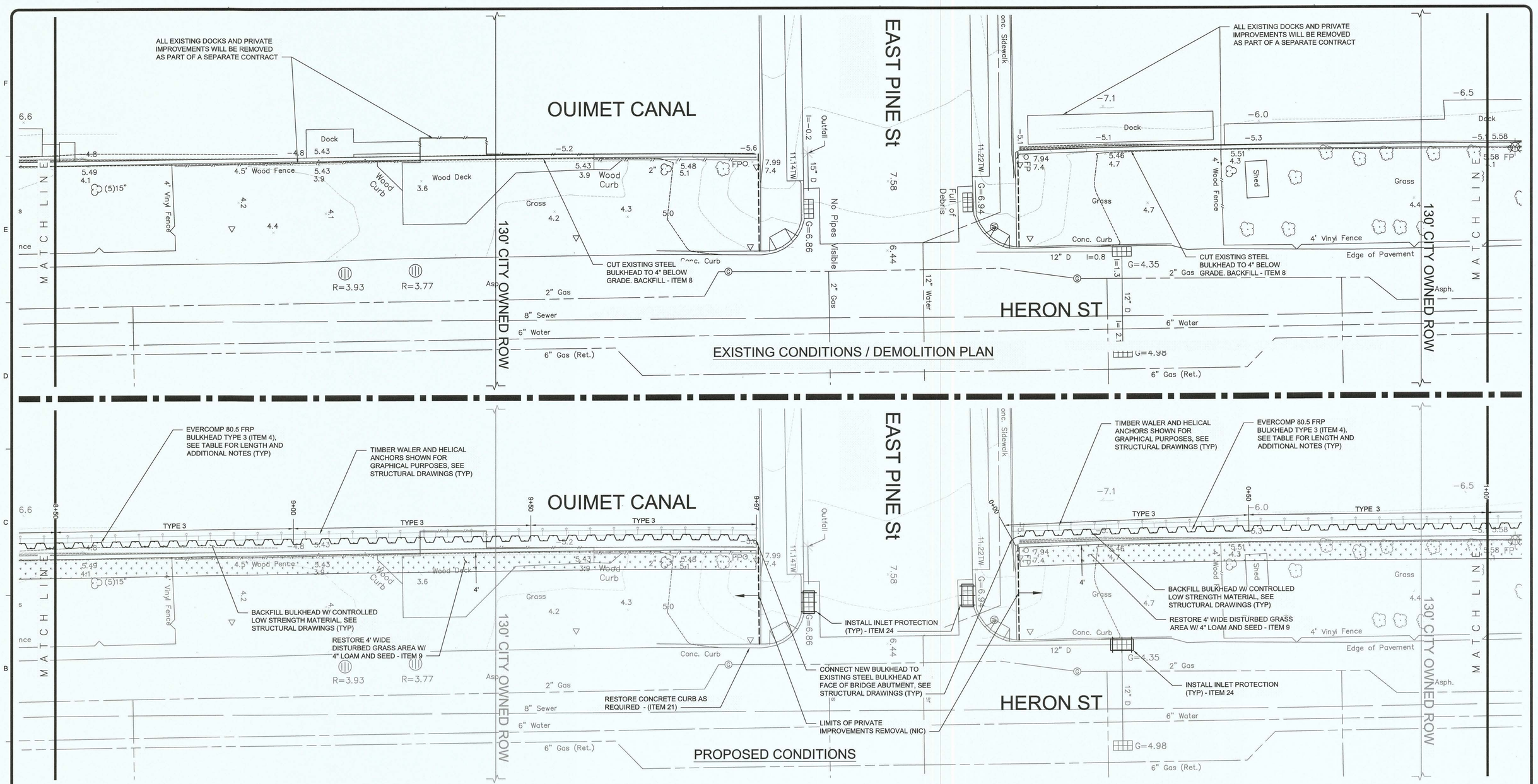
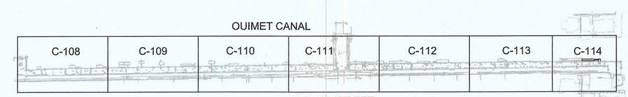


PROPOSED BULKHEAD DESCRIPTIONS - HERON STREET			
STATION		SHEET LENGTH (FT)	HELICAL ANCHORS
START	END		
8+50	9+00	22	5' OC
9+00	9+50	22	5' OC
9+50	9+97	22	5' OC
0+00	0+50	23	5' OC
0+50	1+00	23	5' OC



KEY MAP

SCALE: 1" = 20'

0 5 10 20

SCALE: 1" = 10'

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CITY OF LONG BEACH

NORTH SHORE BULKHEAD PROJECT

HERON STREET BULKHEAD

PROJ:	200-01298-16007
DESN:	JDA
DRWN:	AMB
CHKD:	JO

C-111

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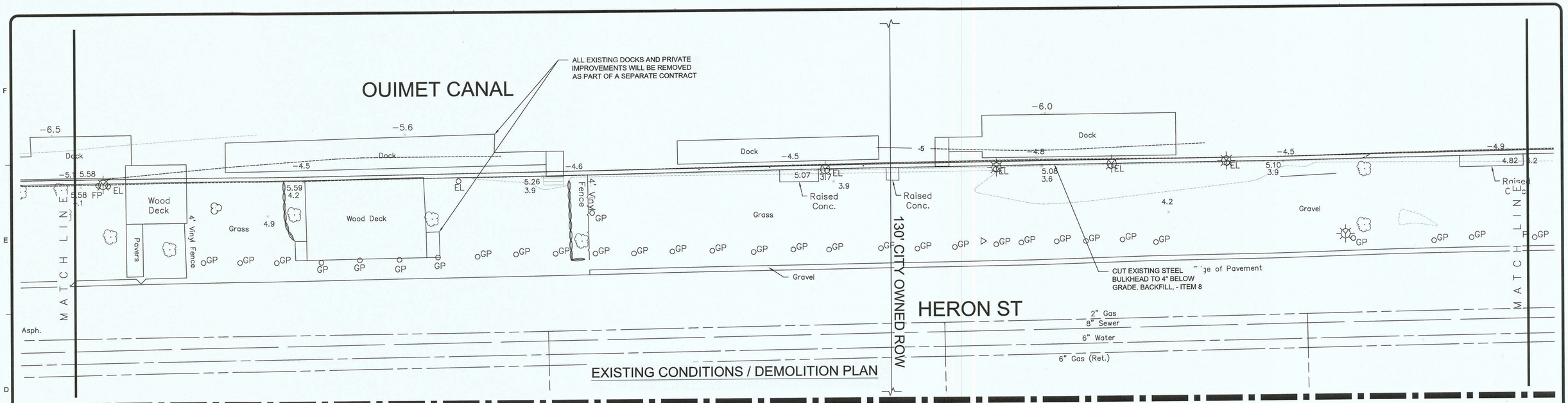
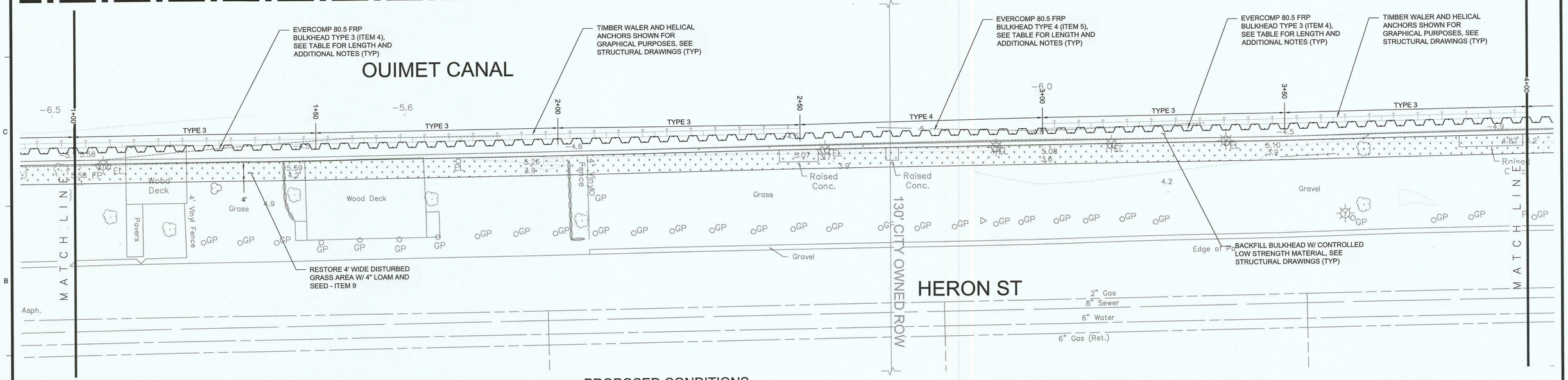
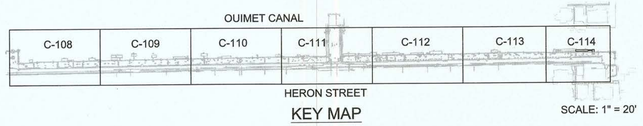


EXISTING CONDITIONS / DEMOLITION PLAN



PROPOSED CONDITIONS

PROPOSED BULKHEAD DESCRIPTIONS - HERON STREET			
STATION		SHEET LENGTH (FT)	HELICAL ANCHORS
START	END		
1+00	1+50	22	5' OC
1+50	2+00	22	5' OC
2+00	2+50	22	5' OC
2+50	3+00	30	-
3+00	3+50	22	5' OC
3+50	4+00	22	5' OC



KEY MAP

SCALE: 1" = 10'

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CITY OF LONG BEACH
NORTH SHORE BULKHEAD PROJECT

HERON STREET BULKHEAD

PROJ:	200-01298-16007
DESN:	JDA
DRWN:	AMB
CHKD:	JO

C-112

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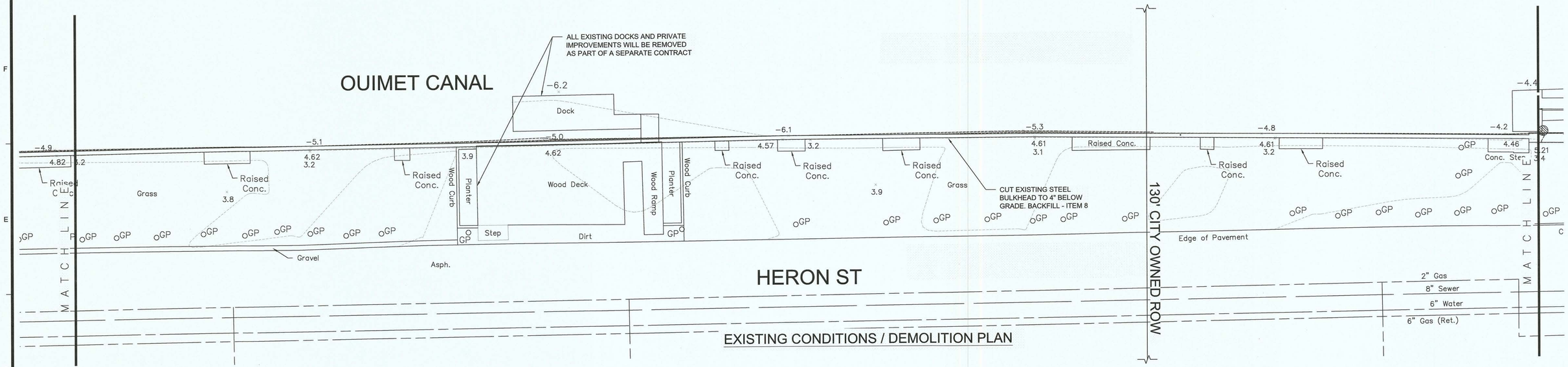
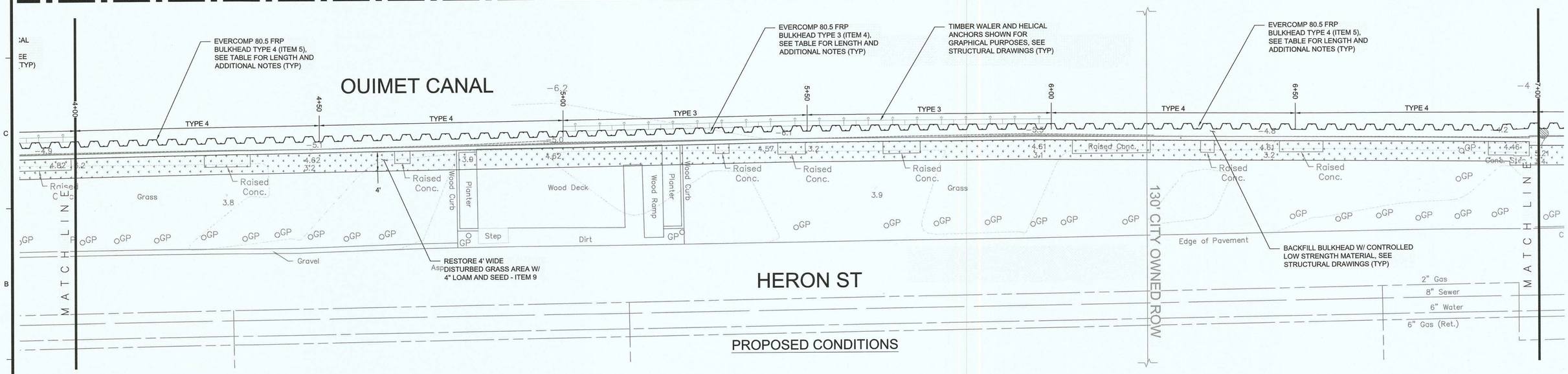
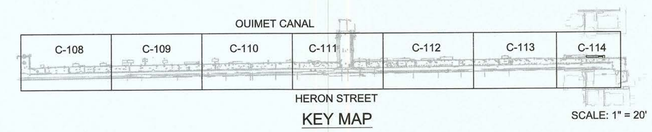




PROPOSED BULKHEAD DESCRIPTIONS - HERON STREET			
STATION		SHEET LENGTH (FT)	HELICAL ANCHORS
START	END		
4+00	4+50	30	-
4+50	5+00	30	-
5+00	5+50	22	5' OC
5+50	6+00	23	5' OC
6+00	6+50	30	-
6+50	7+00	30	-



KEY MAP

0 5 10 20
SCALE: 1" = 10'

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CITY OF LONG BEACH
NORTH SHORE BULKHEAD PROJECT
HERON STREET BULKHEAD

PROJ:	200-01298-16007
DESN:	JDA
DRWN:	AMB
CHKD:	JO

C-113

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Bar measures 1 inch, otherwise drawing not to scale

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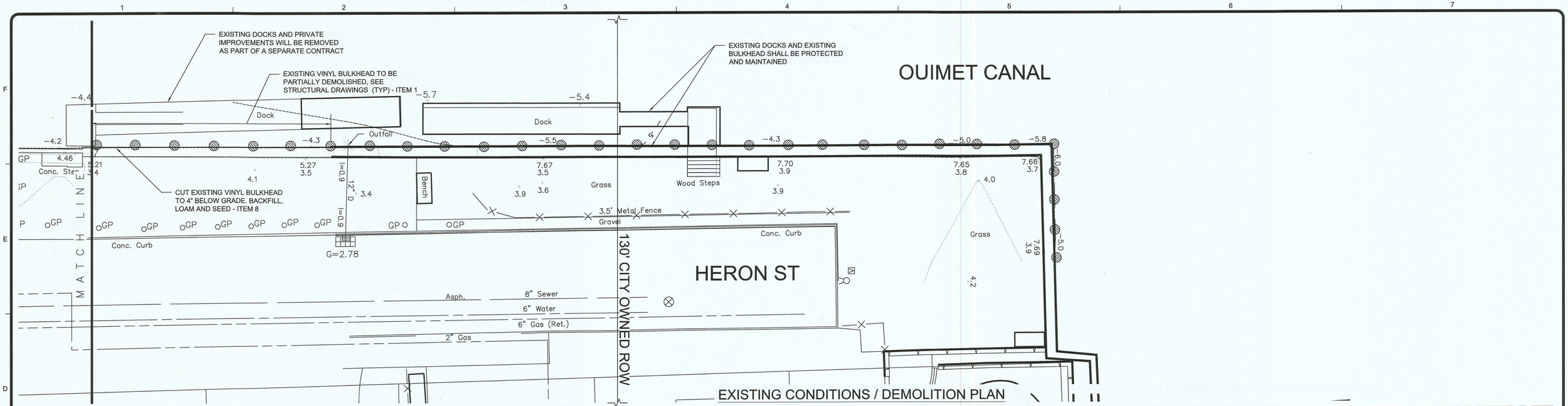
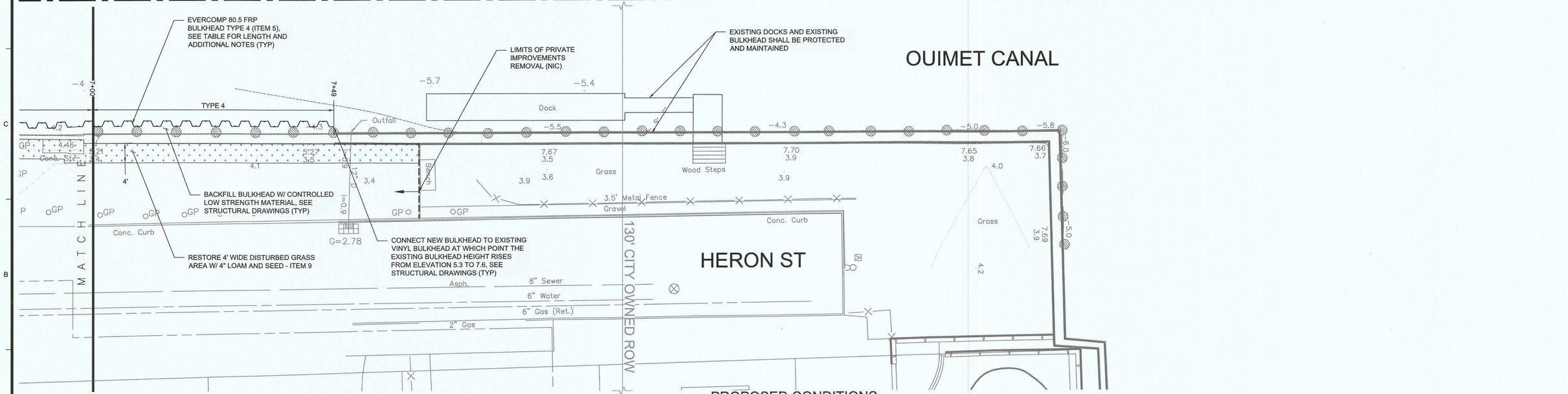
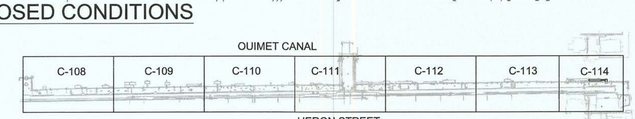


EXISTING CONDITIONS / DEMOLITION PLAN



PROPOSED CONDITIONS

PROPOSED BULKHEAD DESCRIPTIONS - HERON STREET			
STATION		SHEET LENGTH (FT)	HELICAL ANCHORS
START	END		
7+00	7+49	30	-



KEY MAP

SCALE: 1" = 20'

0 5 10 20

SCALE: 1" = 10'

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CITY OF LONG BEACH

NORTH SHORE BULKHEAD PROJECT

HERON STREET BULKHEAD

PROJ:	200-01298-16007
DESN:	JDA
DRWN:	AMB
CHKD:	JO

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Bar measures 1 inch, otherwise drawing not to scale

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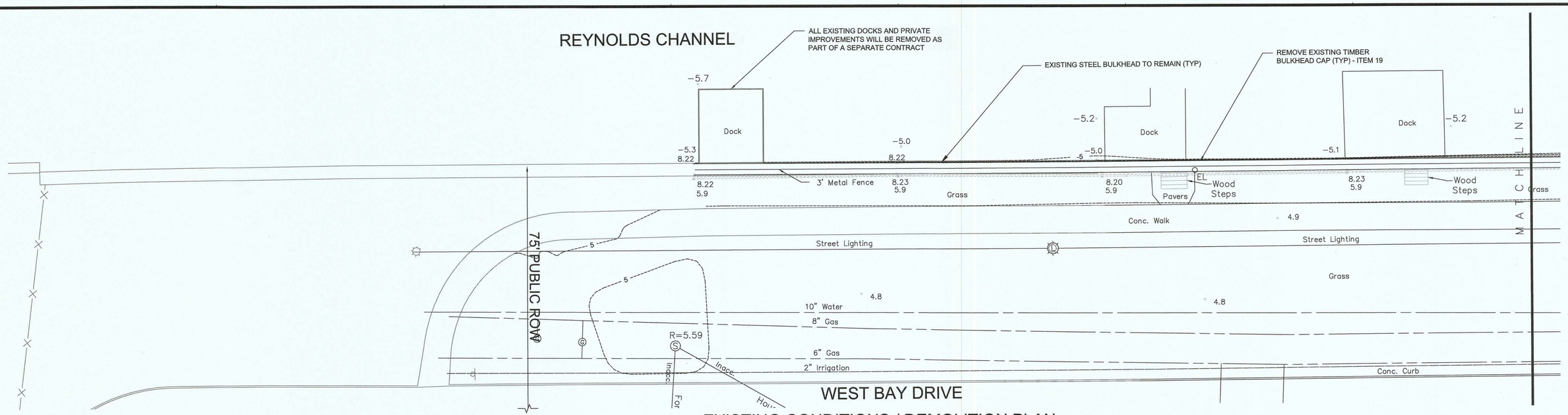
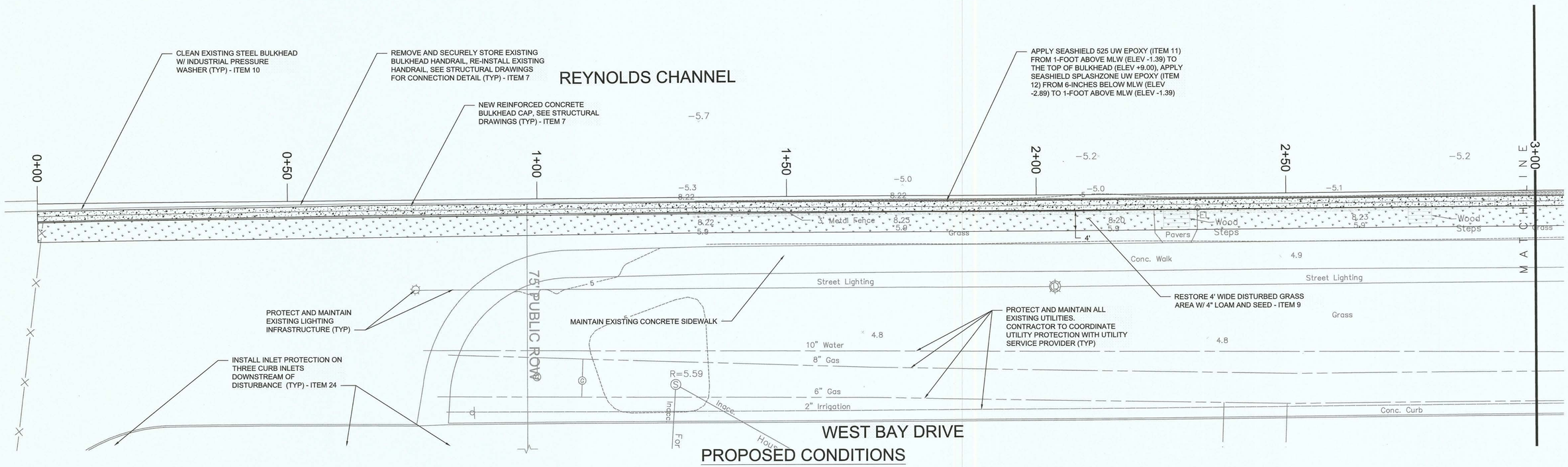


EXISTING CONDITIONS / DEMOLITION PLAN



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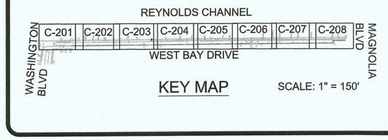

KEY MAP

SCALE: 1" = 150'

0 5 10 20

SCALE: 1" = 10'

N

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CITY OF LONG BEACH

NORTH SHORE BULKHEAD PROJECT

WEST BAY DRIVE
BULKHEAD IMPROVEMENTS

PROJ:	200-01298-16007
DESN:	JDA
DRWN:	AMB
CHKD:	JO

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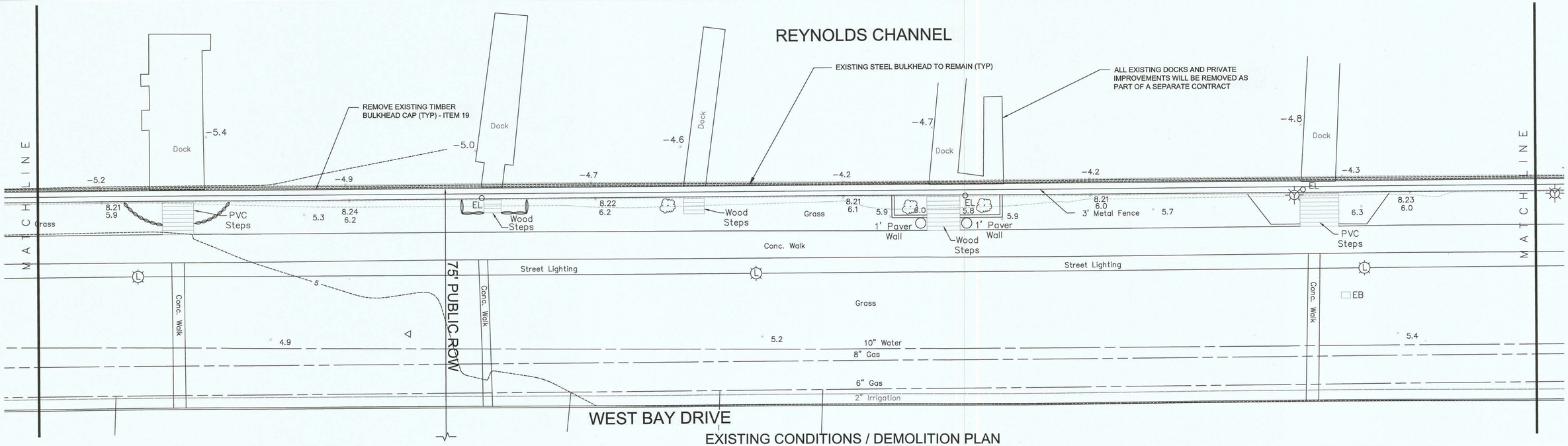
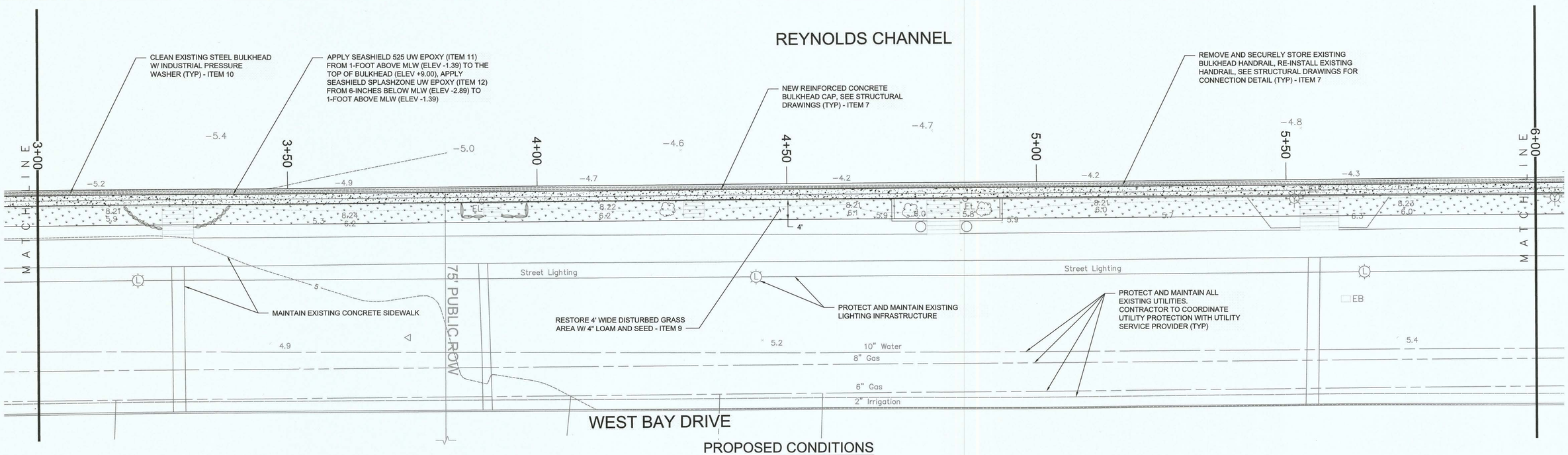


EXISTING CONDITIONS / DEMOLITION PLAN



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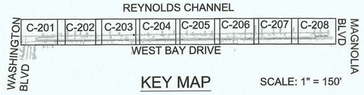

KEY MAP

SCALE: 1" = 150'

0 5 10 20

SCALE: 1" = 10'

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CITY OF LONG BEACH

NORTH SHORE BULKHEAD PROJECT

WEST BAY DRIVE
BULKHEAD IMPROVEMENTS

PROJ:	200-01298-16007
DESN:	JDA
DRWN:	AMB
CHKD:	JO

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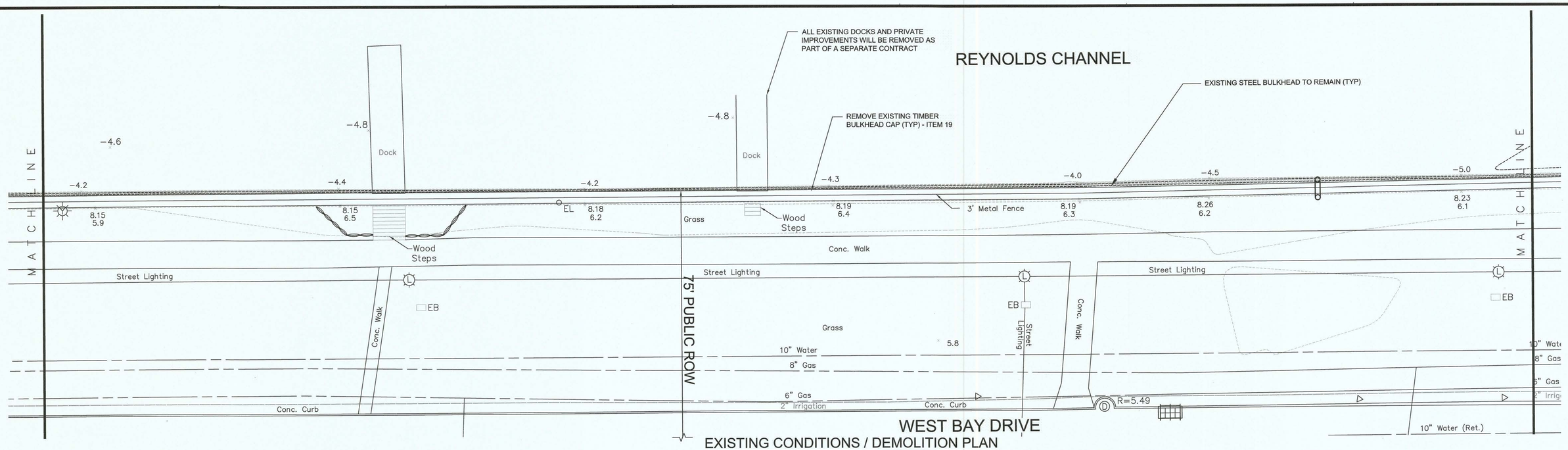
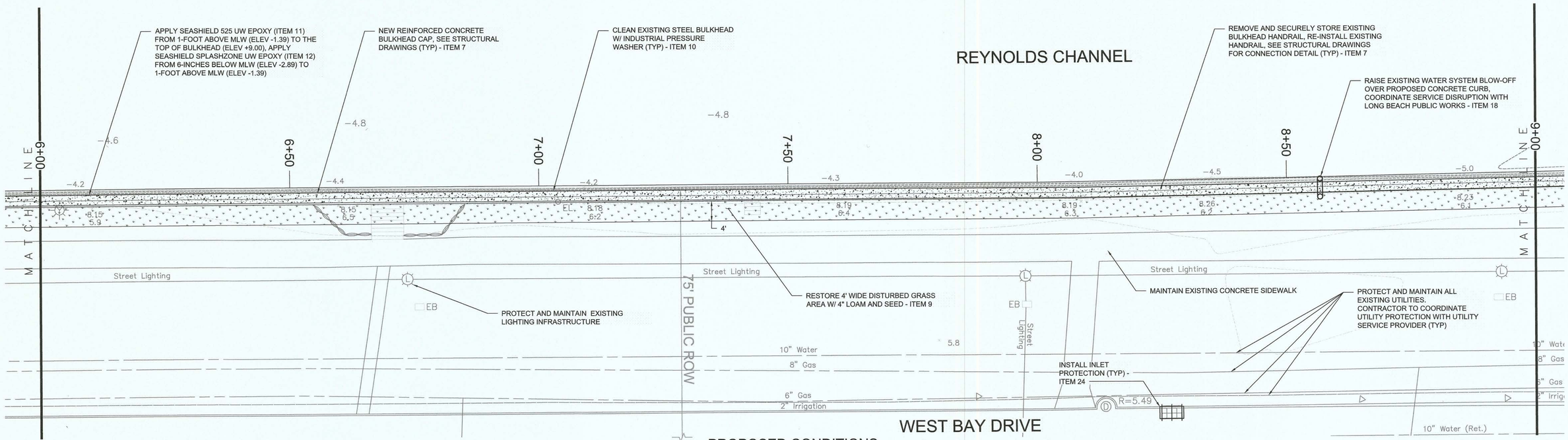


EXISTING CONDITIONS / DEMOLITION PLAN



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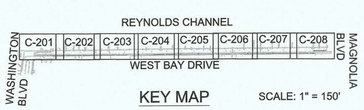

KEY MAP SCALE: 1" = 150'

0 5 10 20
SCALE: 1" = 10'

N

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CITY OF LONG BEACH
NORTH SHORE BULKHEAD PROJECT

WEST BAY DRIVE BULKHEAD IMPROVEMENTS

PROJ:	200-01298-16007
DESN:	JDA
DRWN:	AMB
CHKD:	JO

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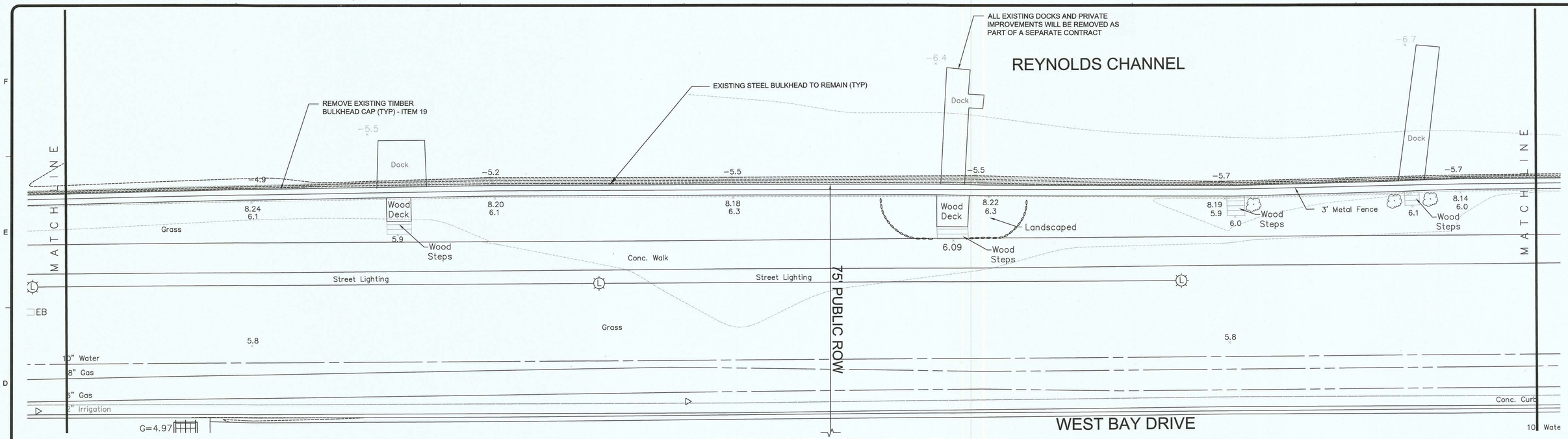
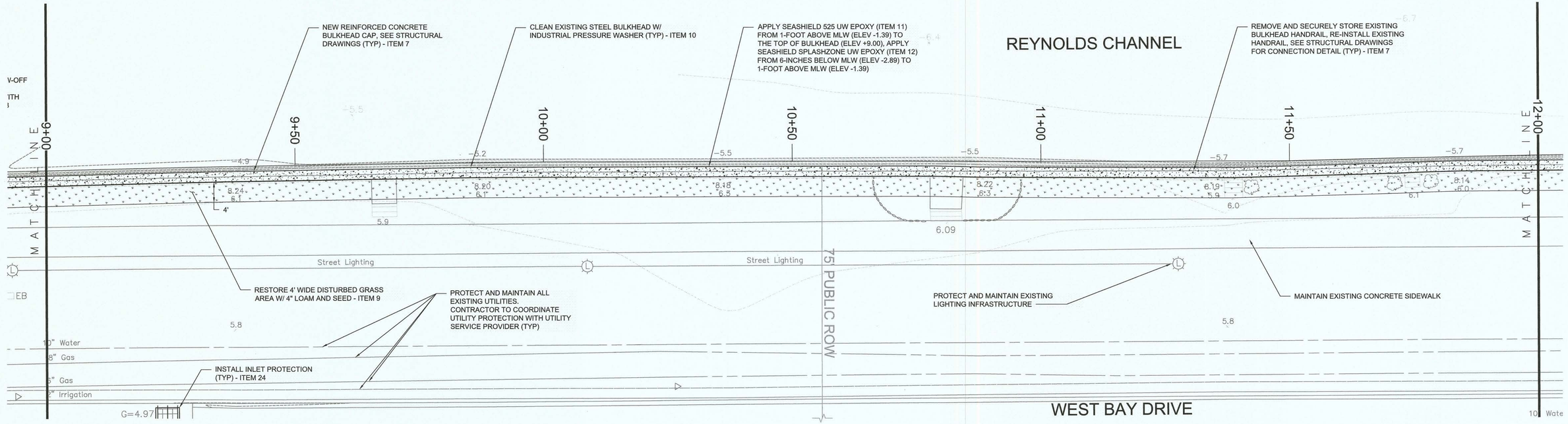


EXISTING CONDITIONS / DEMOLITION PLAN



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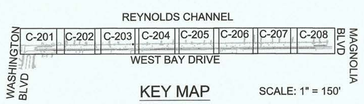

KEY MAP

SCALE: 1" = 150'

0 5 10 20

SCALE: 1" = 10'

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NORTH SHORE BULKHEAD PROJECT

WEST BAY DRIVE BULKHEAD IMPROVEMENTS

PROJ:	200-01298-16007
DESN:	JDA
DRWN:	AMB
CHKD:	JO

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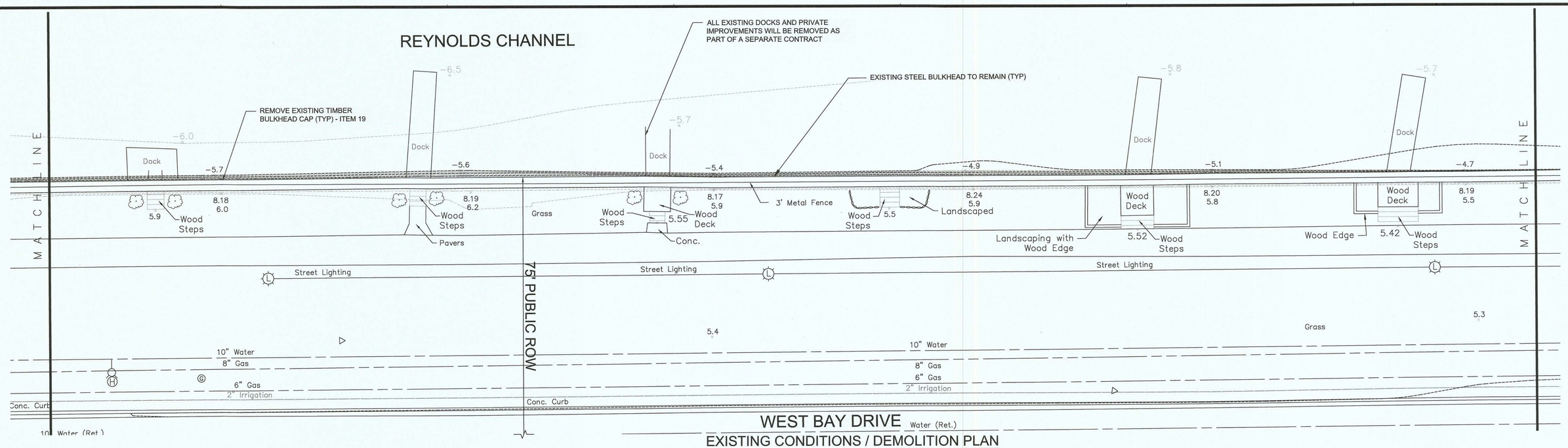
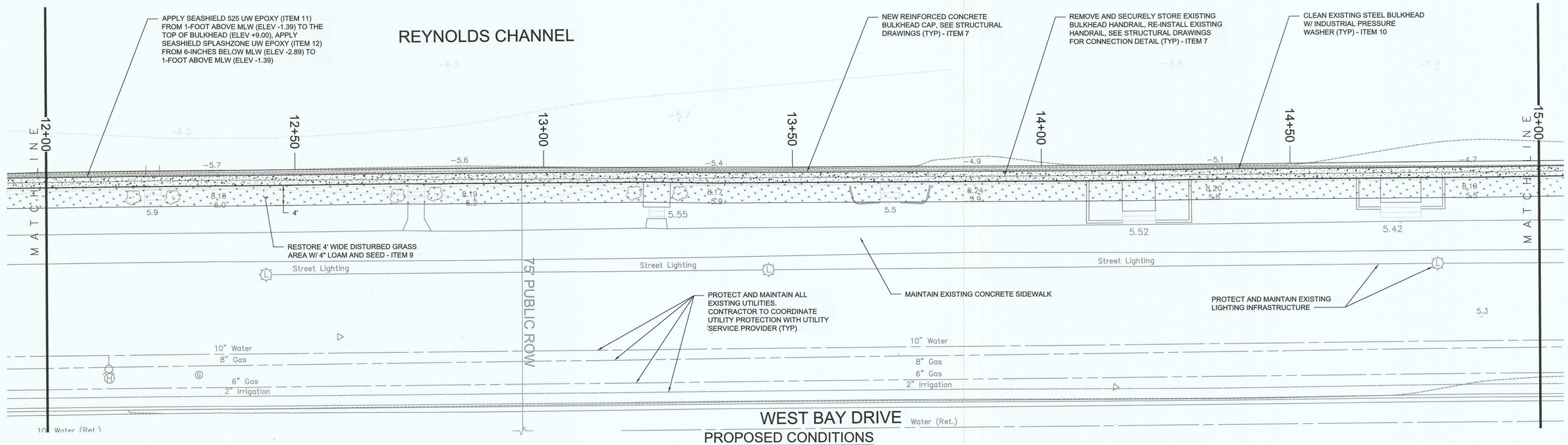


EXISTING CONDITIONS / DEMOLITION PLAN



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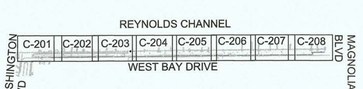

KEY MAP

SCALE: 1" = 150'

0 5 10 20

SCALE: 1" = 10'

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CITY OF LONG BEACH

NORTH SHORE BULKHEAD PROJECT

WEST BAY DRIVE BULKHEAD IMPROVEMENTS

PROJ:	200-01298-16007
DESN:	JDA
DRWN:	AMB
CHKD:	JO

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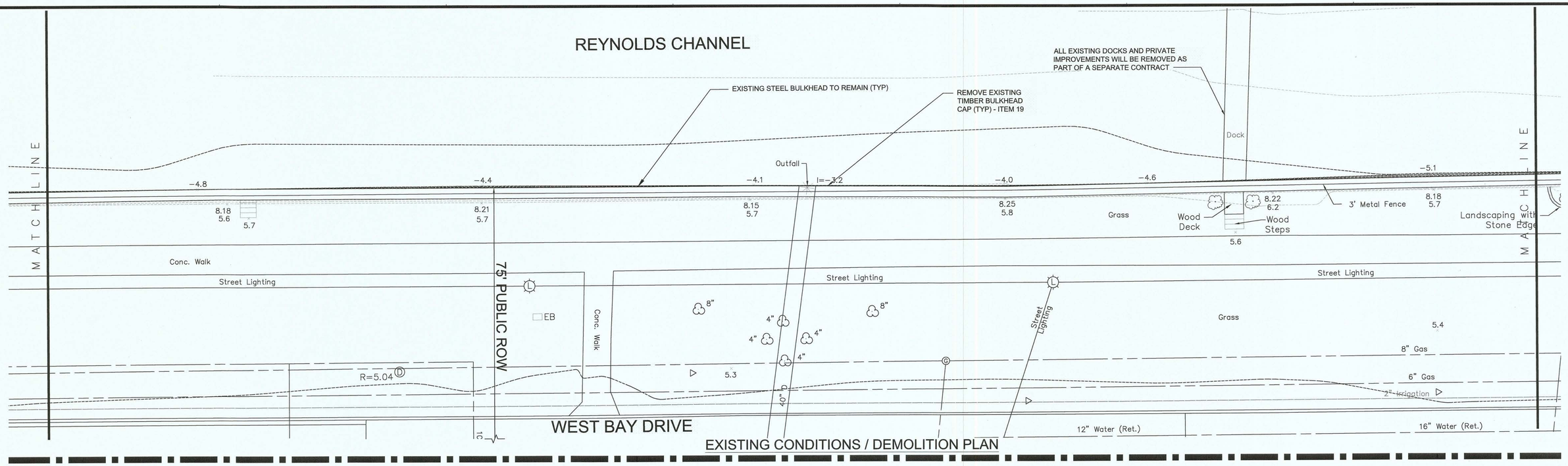

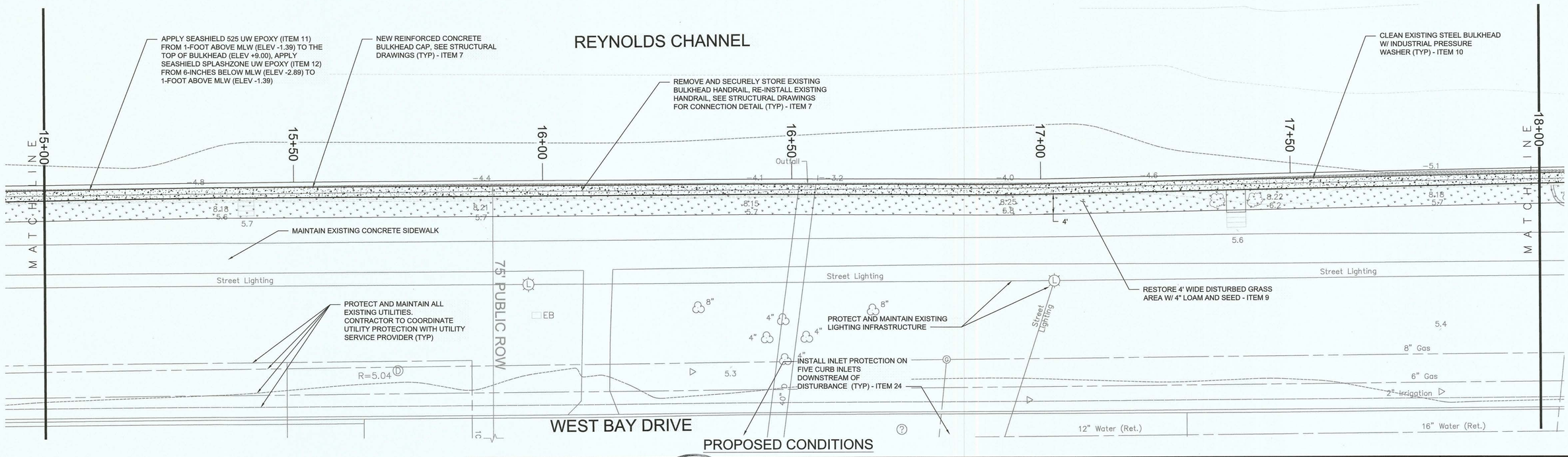

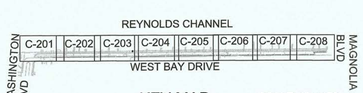

KEY MAP SCALE: 1" = 150'

0 5 10 20
SCALE: 1" = 10'

N

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CITY OF LONG BEACH
NORTH SHORE BULKHEAD PROJECT

WEST BAY DRIVE BULKHEAD IMPROVEMENTS

PROJ:	200-01298-16007
DESN:	JDA
DRWN:	AMB
CHKD:	JO

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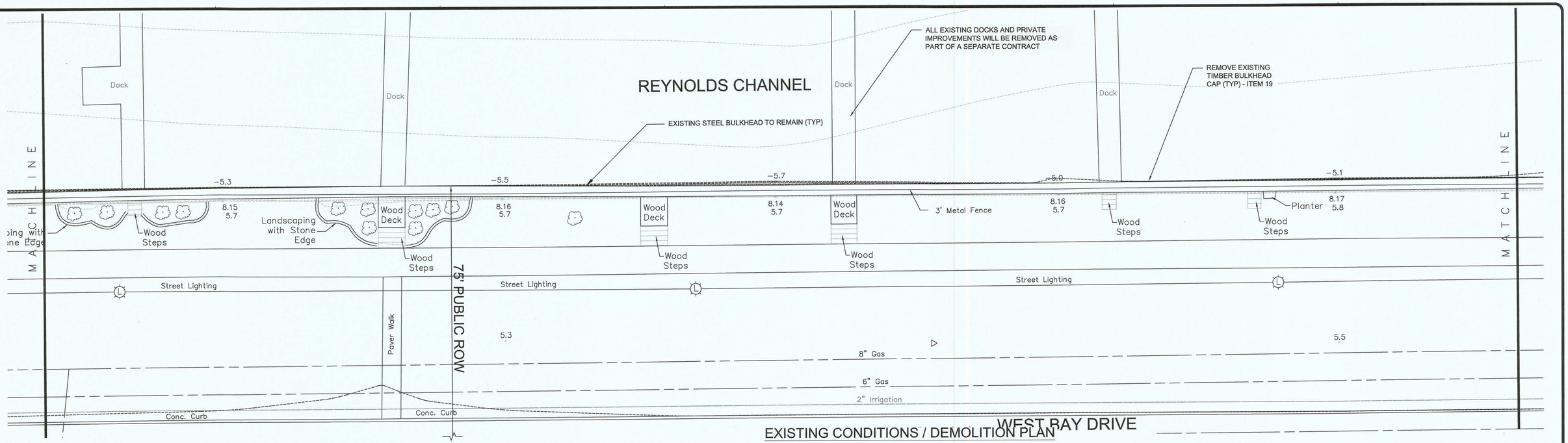
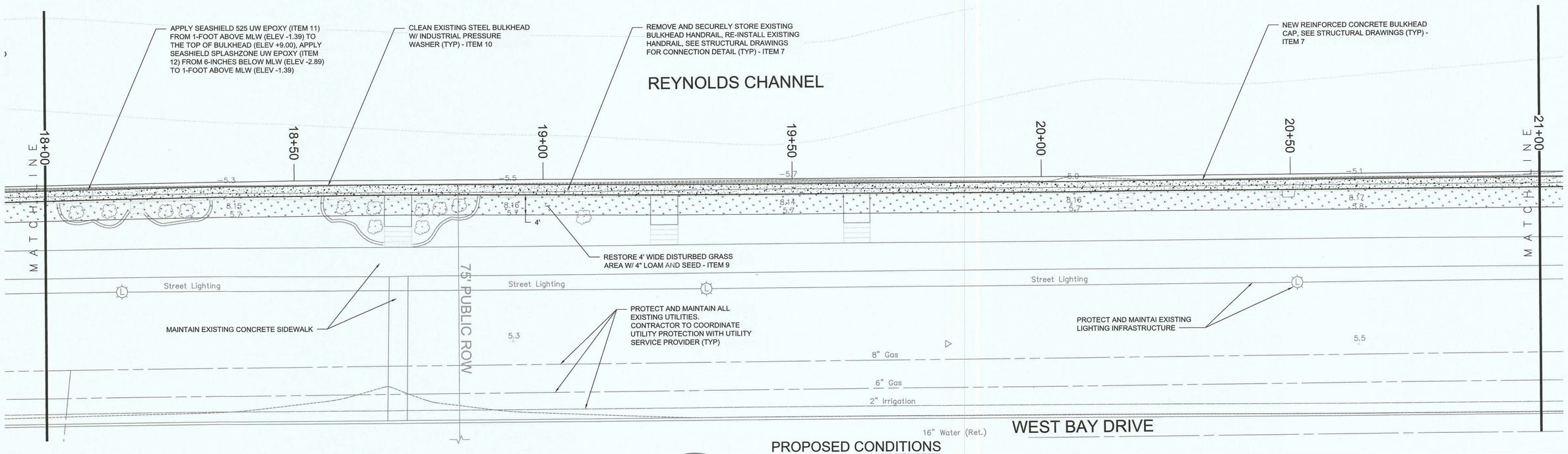


EXISTING CONDITIONS / DEMOLITION PLAN



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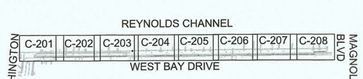

KEY MAP SCALE: 1" = 150'

0 5 10 20
SCALE: 1" = 10'

N

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CITY OF LONG BEACH
NORTH SHORE BULKHEAD PROJECT
WEST BAY DRIVE
BULKHEAD IMPROVEMENTS

PROJ:	200-01298-16007
DESN:	JDA
DRWN:	AMB
CHKD:	JO

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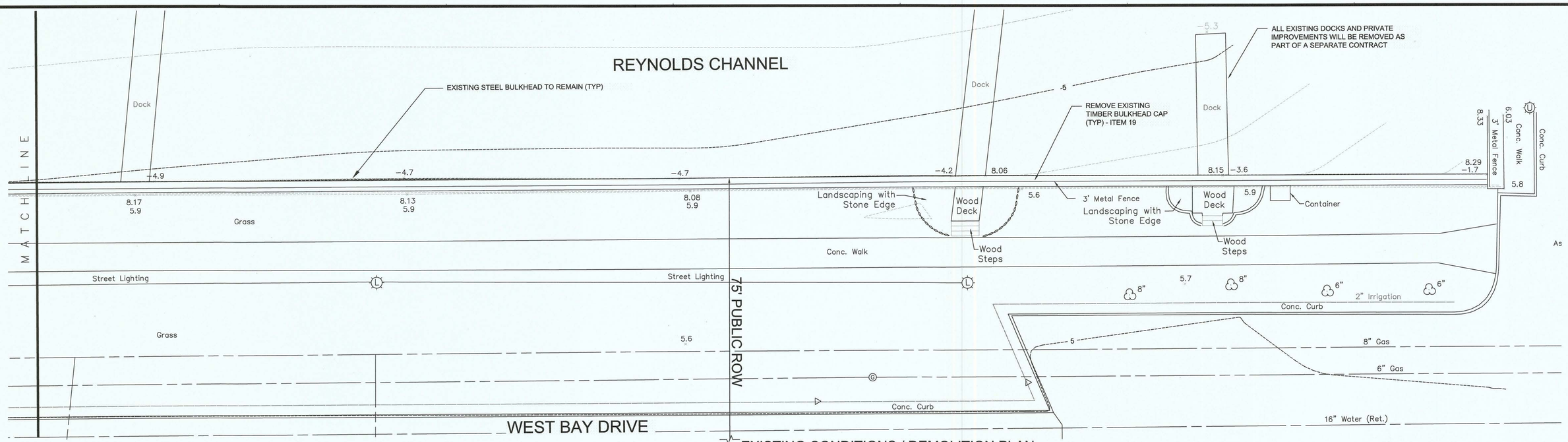
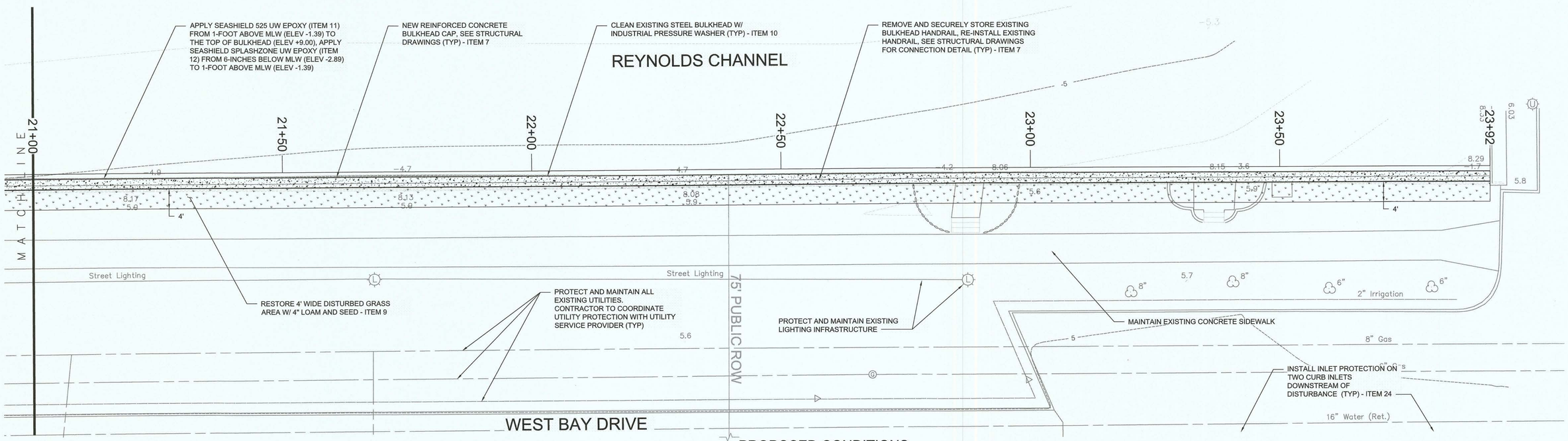


EXISTING CONDITIONS / DEMOLITION PLAN



PROPOSED CONDITIONS

KEY MAP SCALE: 1" = 150'

0 5 10 20
SCALE: 1" = 10'

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CITY OF LONG BEACH
NORTH SHORE BULKHEAD PROJECT

WEST BAY DRIVE BULKHEAD IMPROVEMENTS

PROJ:	200-01298-16007
DESN:	JDA
DRWN:	AMB
CHKD:	JO

C-208

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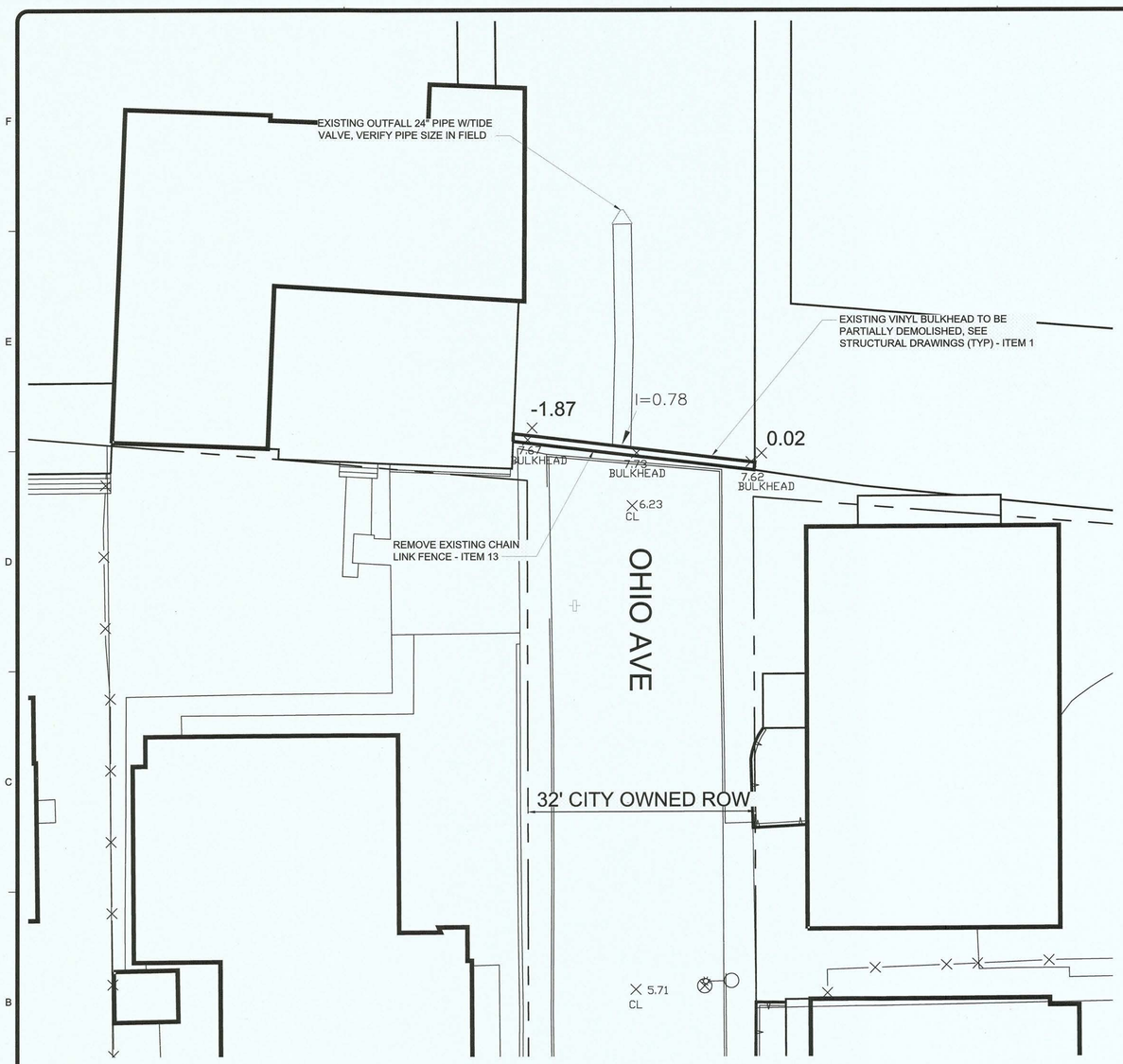
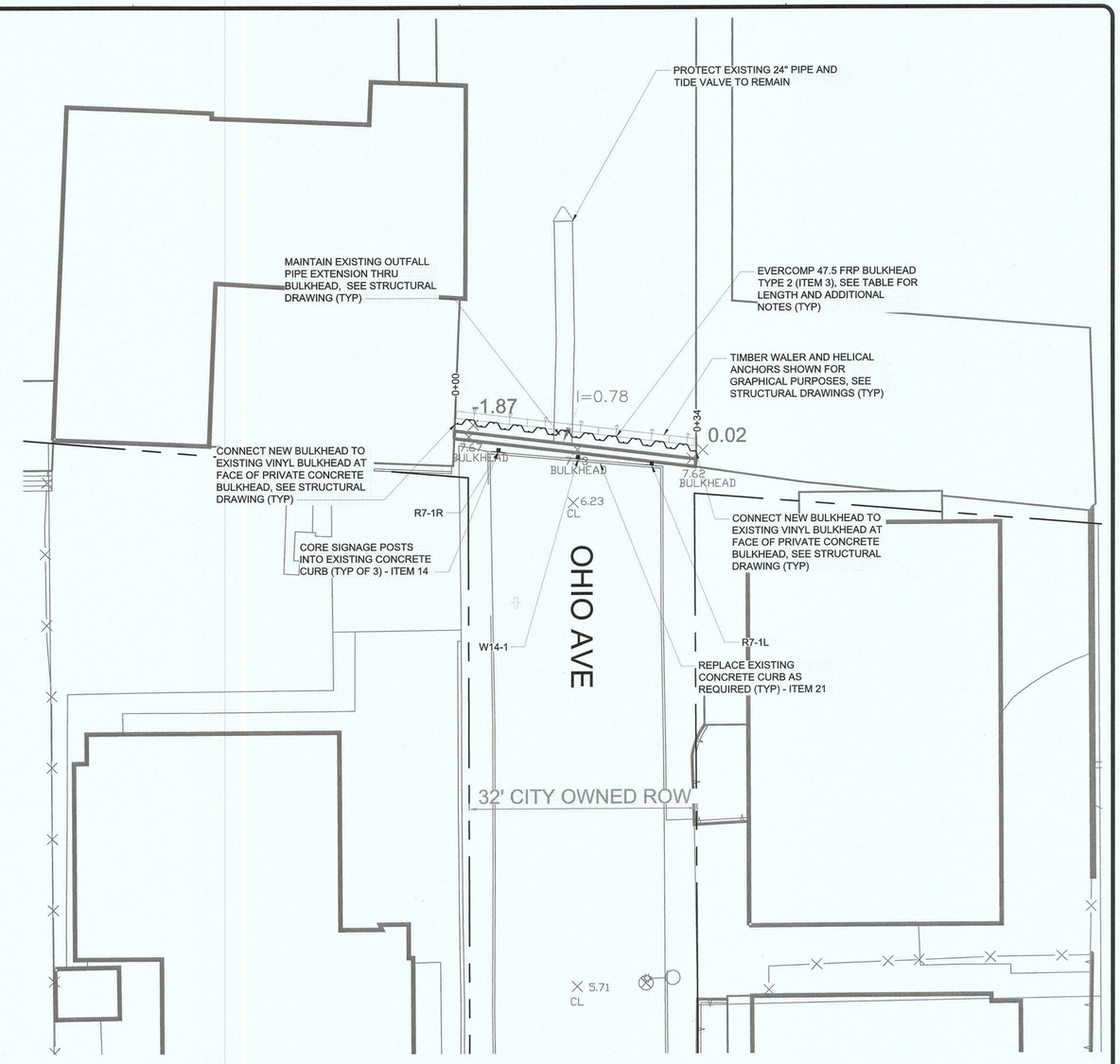


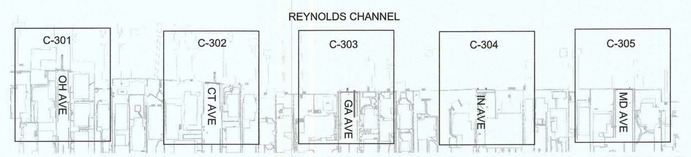
EXISTING CONDITIONS / DEMOLITION PLAN



PROPOSED CONDITIONS

NOTES:
1. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO PRIVATE HOMEOWNER'S FENCES DURING CONSTRUCTION
2. ALL SIGNAGE TO COMPLY W/ USDOT 2009 MUTCD DESIGN GUIDELINES

PROPOSED BULKHEAD DESCRIPTIONS - OHIO AVE			
STATION		SHEET LENGTH (FT)	HELICAL ANCHORS
START	END		
0+00	0+34	19	6' OC



KEY MAP

SCALE: 1" = 200'

0 5 10 20
SCALE: 1" = 10'

N

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CITY OF LONG BEACH
NORTH SHORE BULKHEAD PROJECT

OHIO AVENUE BULKHEAD

PROJ:	200-01298-16007
DESN:	JDA
DRWN:	AMB
CHKD:	JO

C-301

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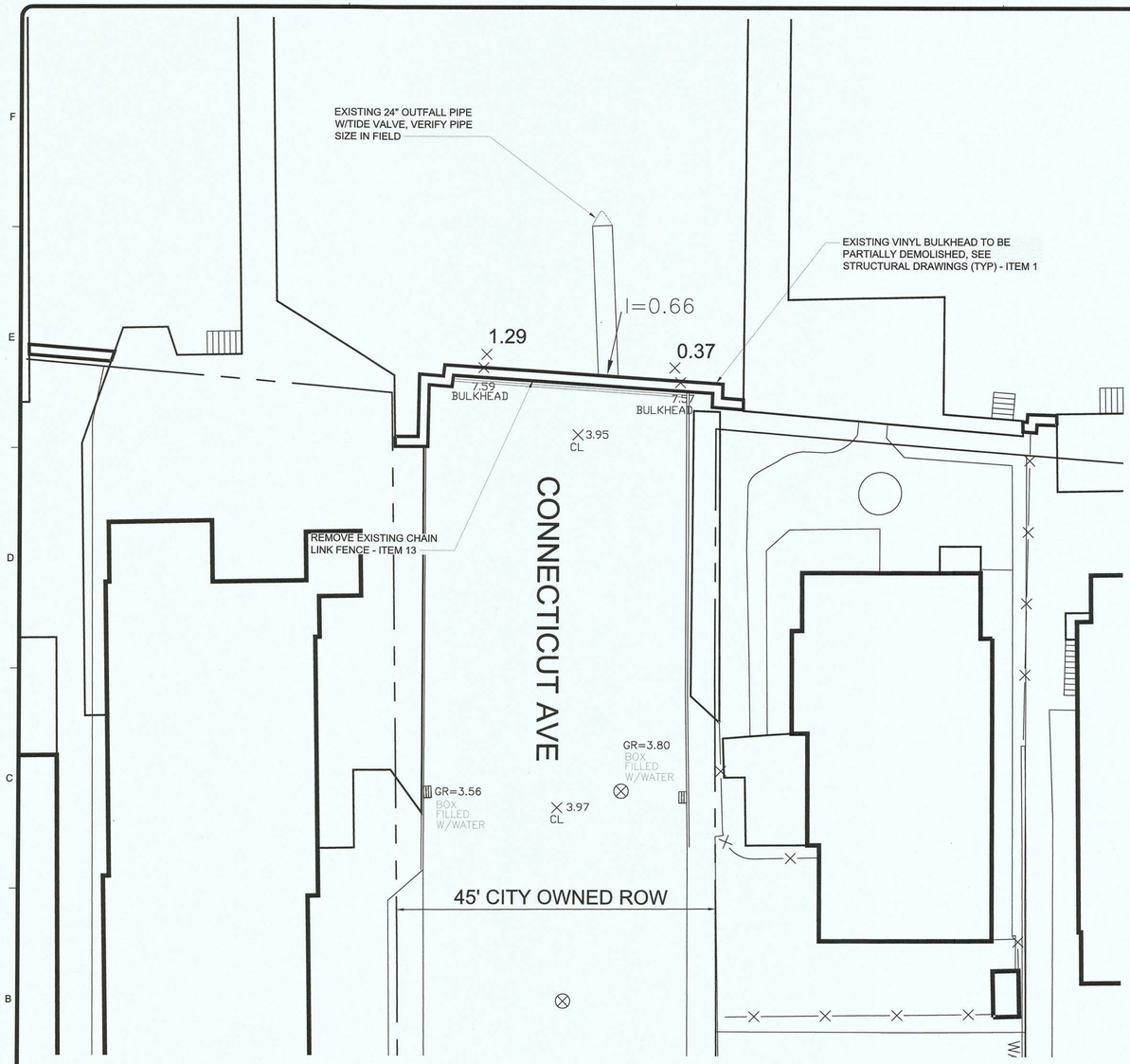
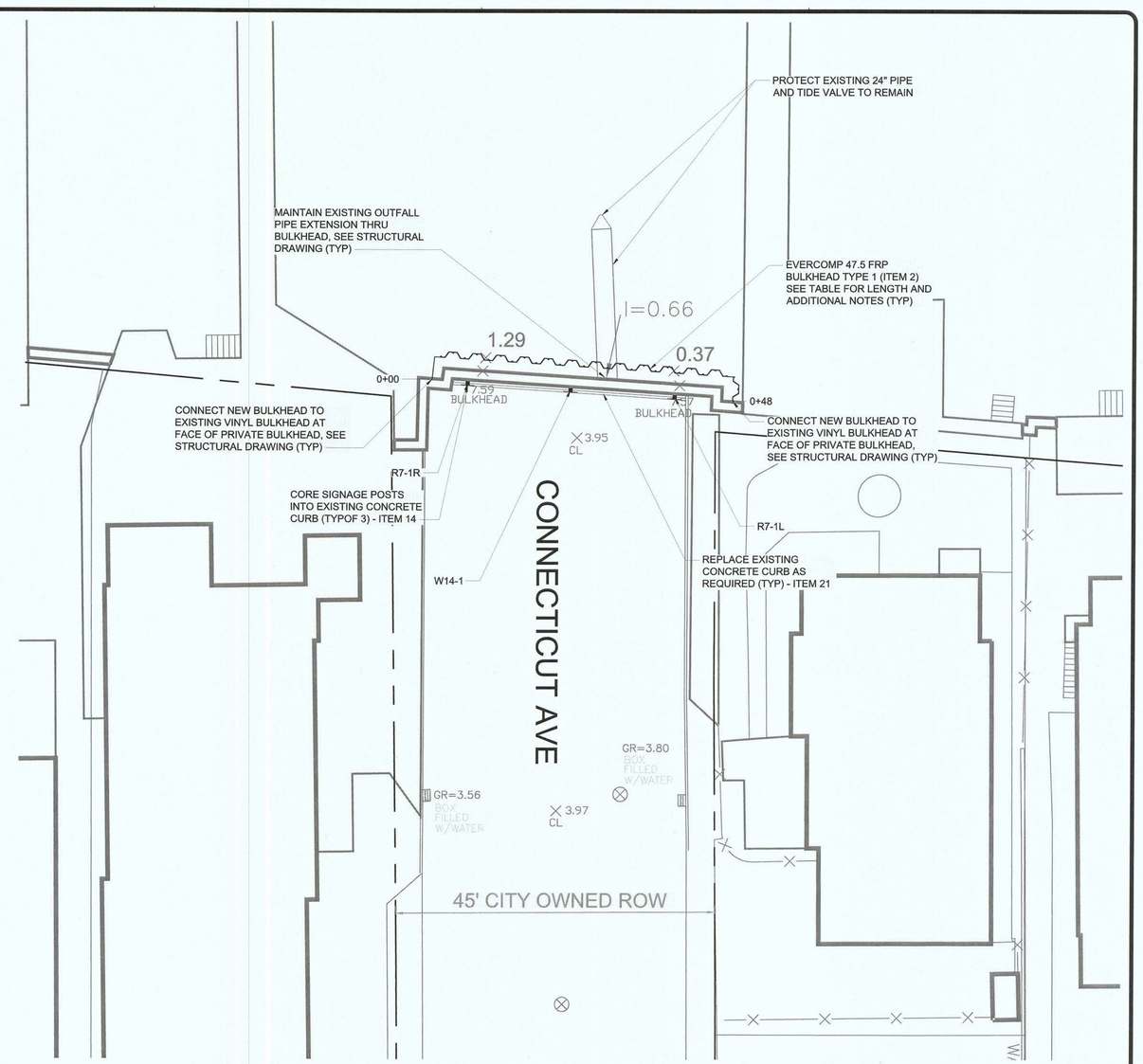


EXISTING CONDITIONS / DEMOLITION PLAN

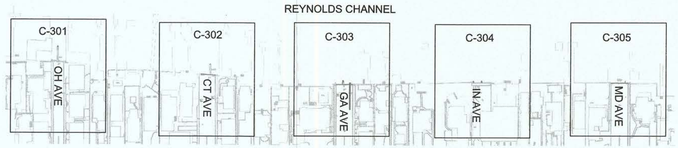


PROPOSED CONDITIONS

NOTES:
1. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO PRIVATE HOMEOWNER'S FENCES DURING CONSTRUCTION
2. ALL SIGNAGE TO COMPLY W/ USDOT 2009 MUTCD DESIGN GUIDELINES

PROPOSED BULKHEAD DESCRIPTIONS - CONNECTICUT AVE

STATION		SHEET LENGTH (FT)	HELICAL ANCHORS
START	END		
0+00	0+48	24	-



KEY MAP

SCALE: 1" = 200'

0 5 10 20
SCALE: 1" = 10'

N

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CITY OF LONG BEACH
NORTH SHORE BULKHEAD PROJECT
CONNECTICUT AVENUE BULKHEAD

PROJ:	200-01298-16007
DESN:	JDA
DRWN:	AMB
CHKD:	JO

C-302

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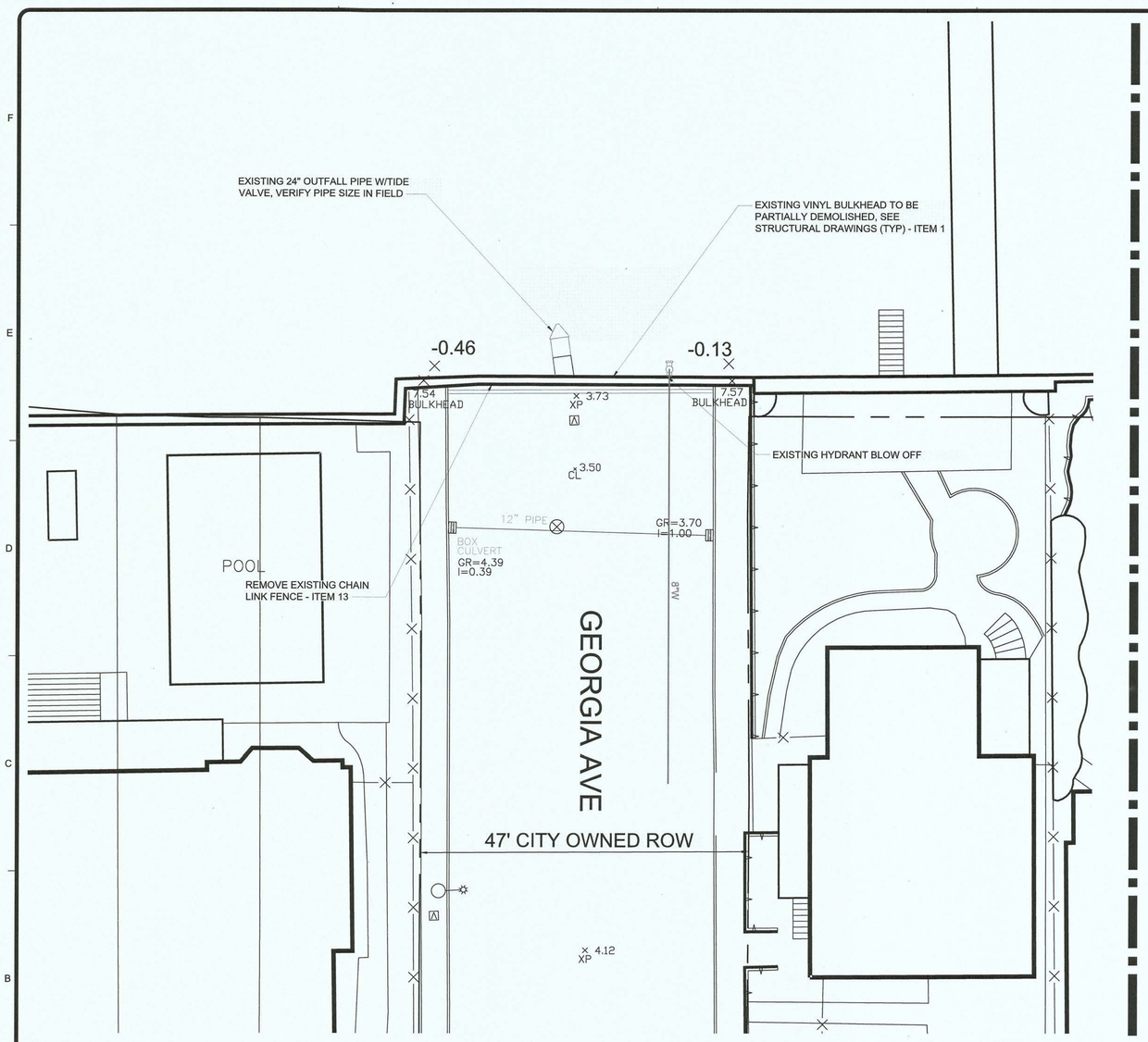
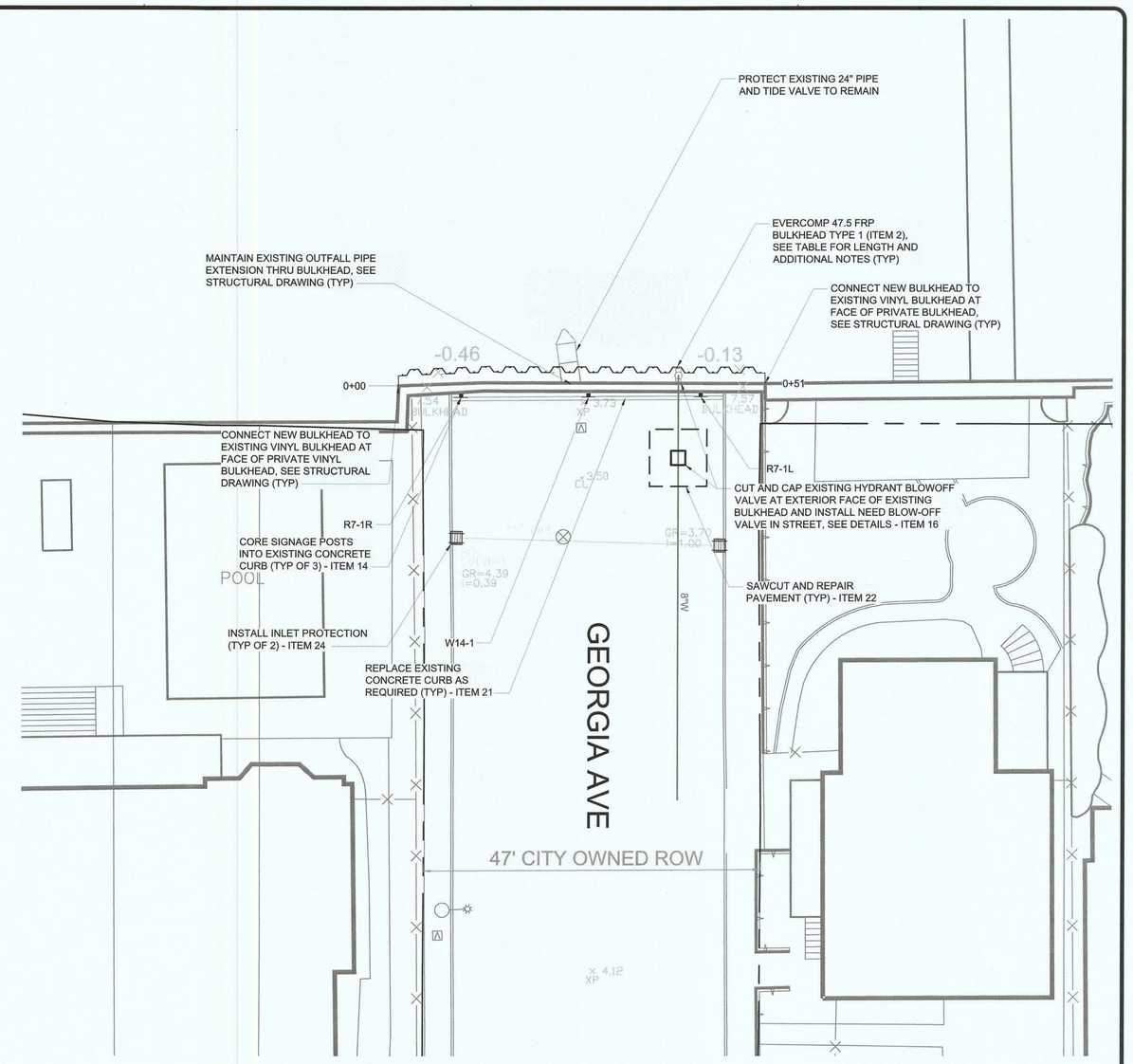


EXISTING CONDITIONS / DEMOLITION PLAN

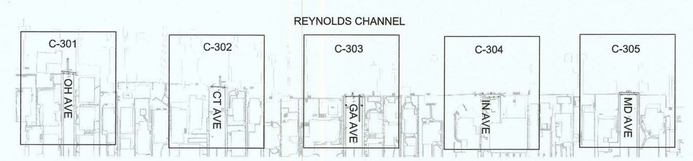


PROPOSED CONDITIONS

NOTES:
1. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO PRIVATE HOMEOWNER'S FENCES DURING CONSTRUCTION
2. ALL SIGNAGE TO COMPLY W/ USDOT 2009 MUTCD DESIGN GUIDELINES

PROPOSED BULKHEAD DESCRIPTIONS - GEORGIA AVE

STATION		SHEET LENGTH (FT)	HELICAL ANCHORS
START	END		
0+00	0+51	24	-



KEY MAP

SCALE: 1" = 200'

0 5 10 20
SCALE: 1" = 10'

N

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CITY OF LONG BEACH
NORTH SHORE BULKHEAD PROJECT
GEORGIA AVENUE BULKHEAD

PROJ:	200-01298-16007
DESN:	JDA
DRWN:	AMB
CHKD:	JO

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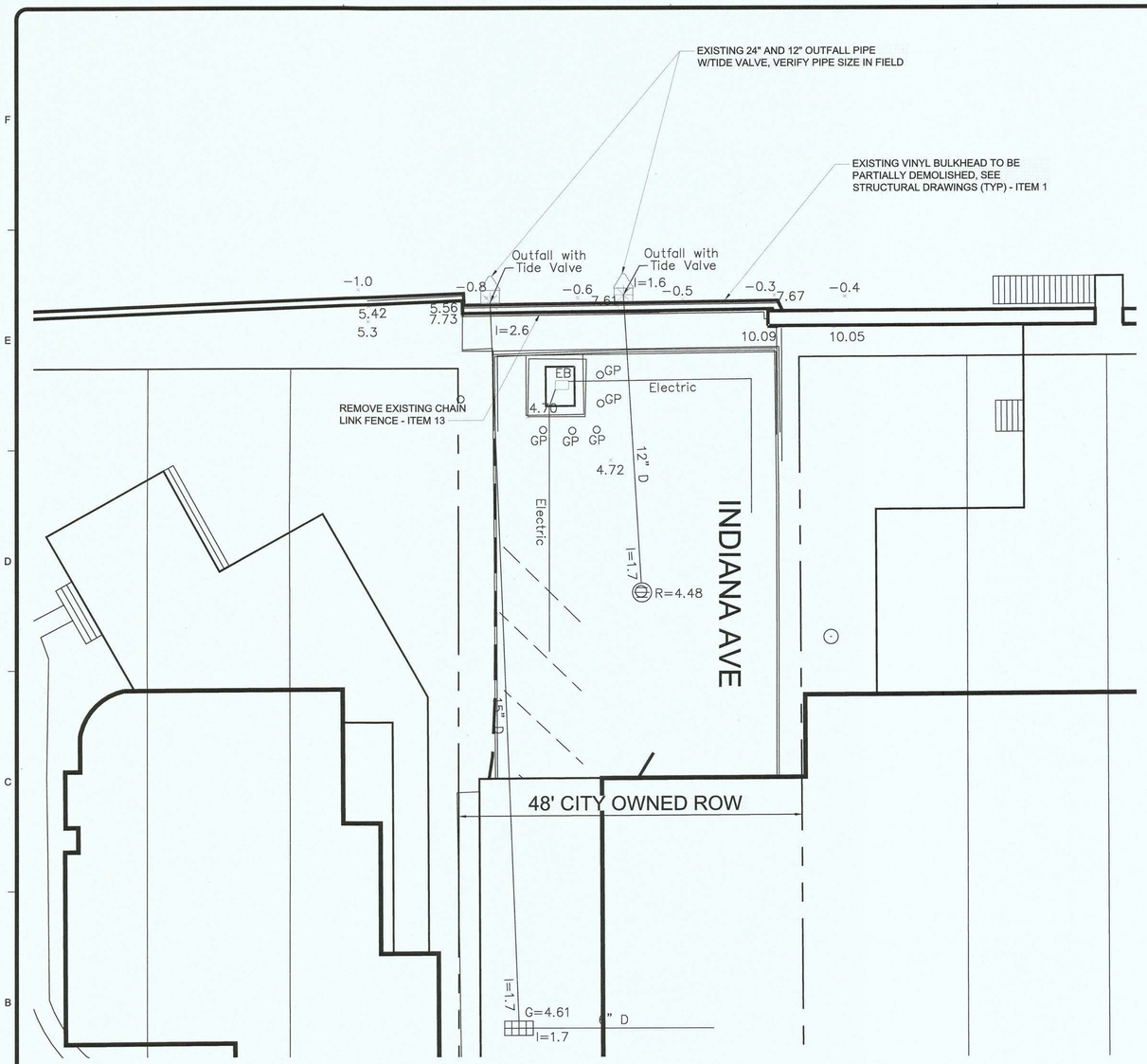
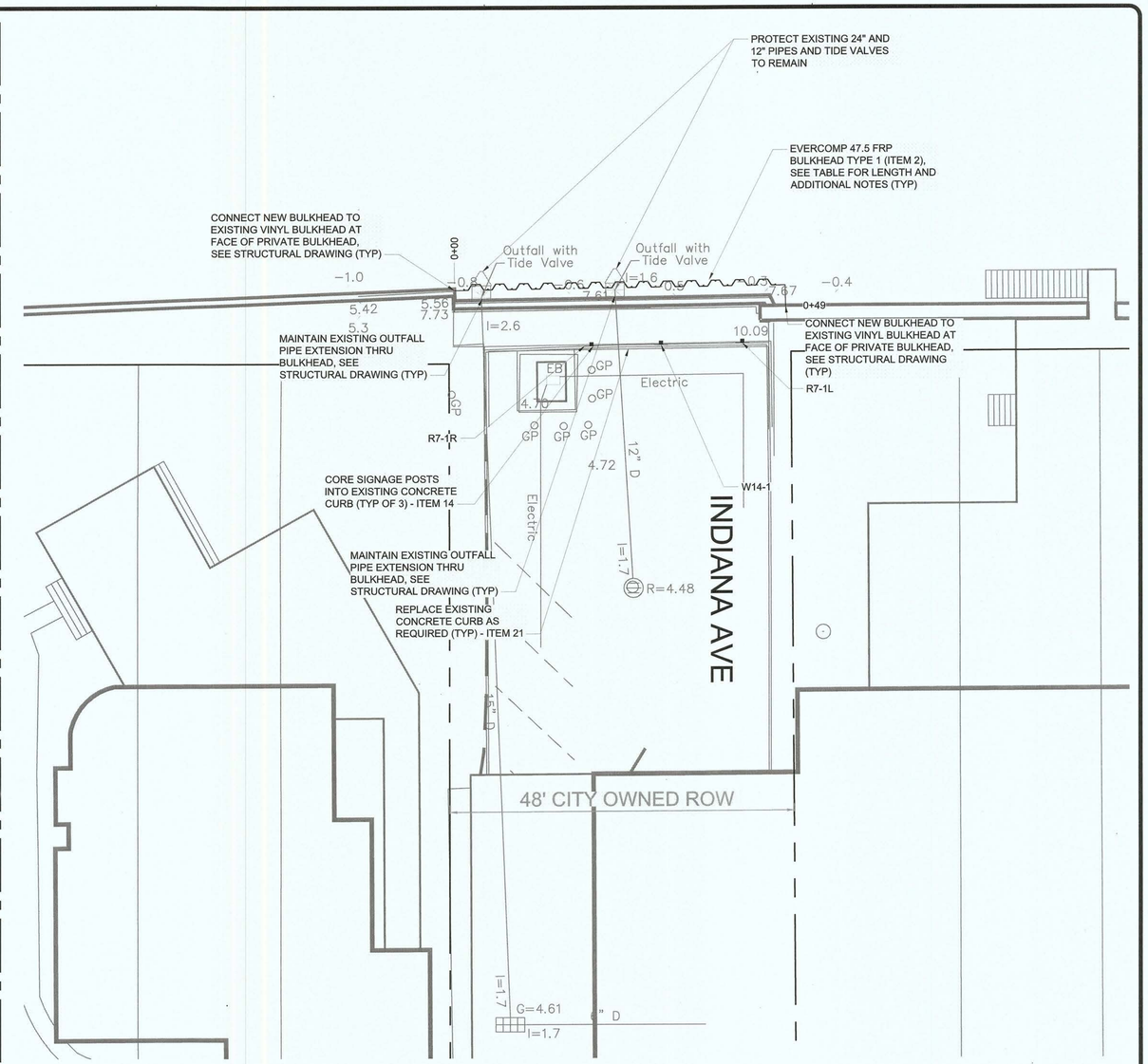


EXISTING CONDITIONS / DEMOLITION PLAN

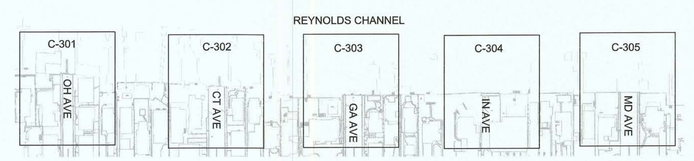


PROPOSED CONDITIONS

NOTES:
1. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO PRIVATE HOMEOWNER'S FENCES DURING CONSTRUCTION
2. ALL SIGNAGE TO COMPLY W/ USDOT 2009 MUTCD DESIGN GUIDELINES

PROPOSED BULKHEAD DESCRIPTIONS - INDIANA AVE

STATION		SHEET LENGTH (FT)	HELICAL ANCHORS
START	END		
0+00	0+49	27	-



KEY MAP

SCALE: 1" = 200'

0 5 10 20
SCALE: 1" = 10'

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CITY OF LONG BEACH
NORTH SHORE BULKHEAD PROJECT
INDIANA AVENUE BULKHEAD

PROJ:	200-01298-16007
DESN:	JDA
DRWN:	AMB
CHKD:	JO

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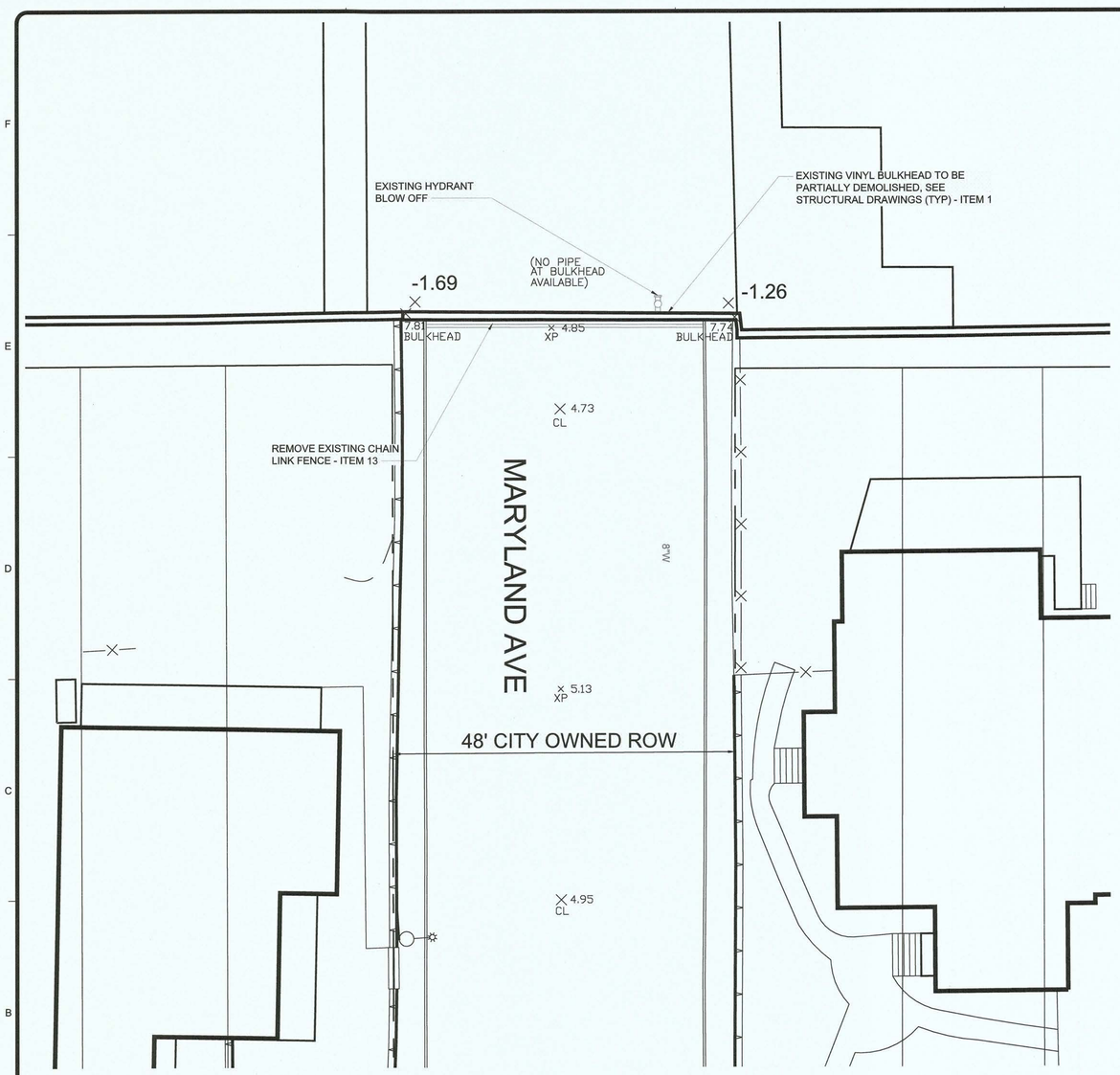
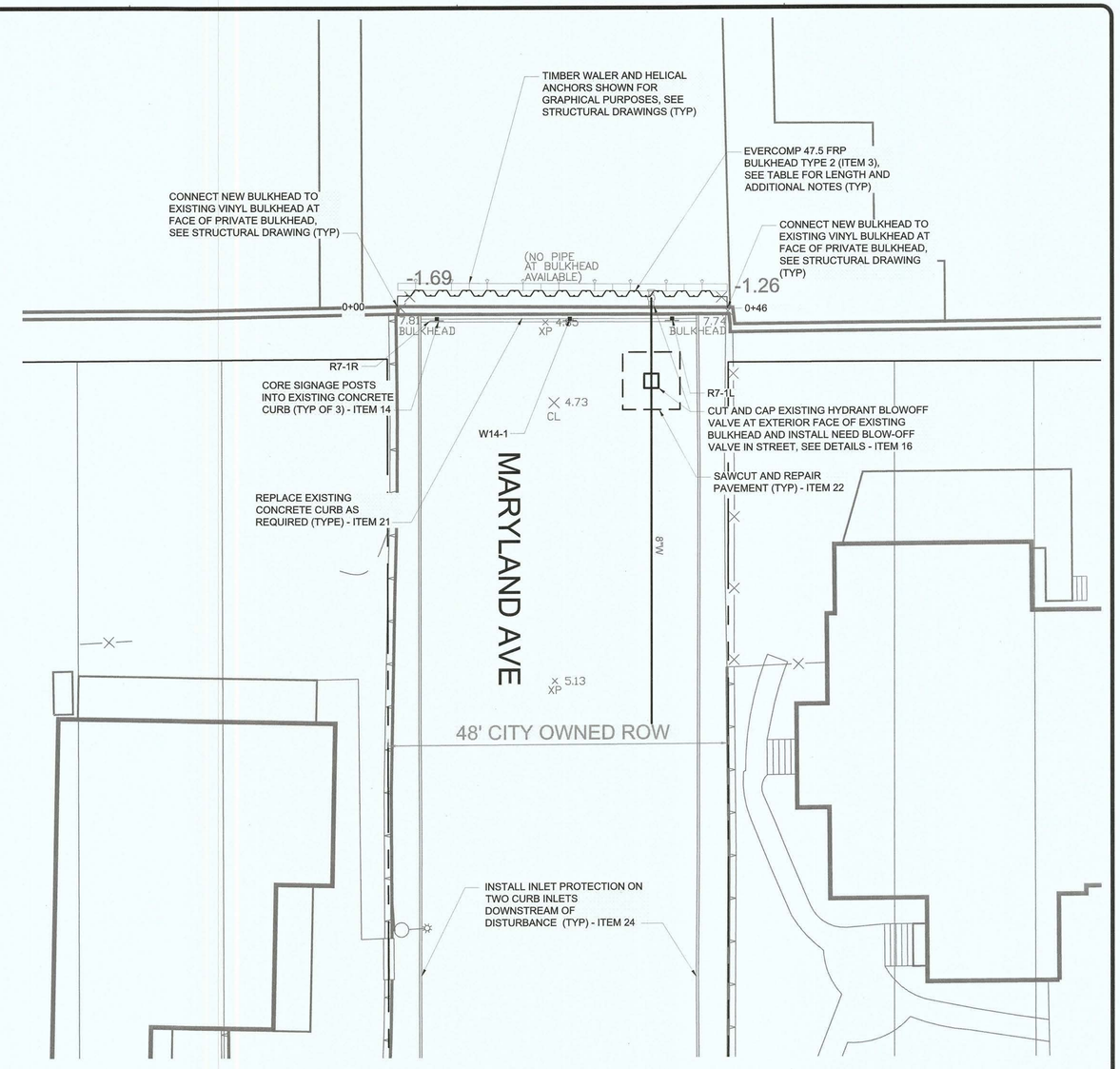


EXISTING CONDITIONS / DEMOLITION PLAN

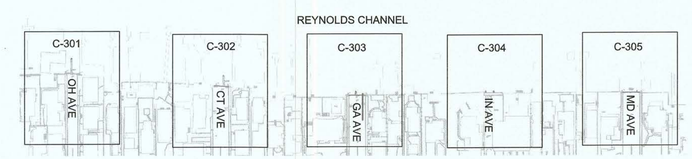


PROPOSED CONDITIONS

NOTES:
1. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO PRIVATE HOMEOWNER'S FENCES DURING CONSTRUCTION
2. ALL SIGNAGE TO COMPLY W/ USDOT 2009 MUTCD DESIGN GUIDELINES

PROPOSED BULKHEAD DESCRIPTIONS - MARYLAND AVE

STATION		SHEET LENGTH (FT)	HELICAL ANCHORS
START	END		
0+00	0+46	19	6' OC



KEY MAP

SCALE: 1" = 200'

0 5 10 20
SCALE: 1" = 10'

N

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CITY OF LONG BEACH
NORTH SHORE BULKHEAD PROJECT
MARYLAND AVENUE BULKHEAD

PROJ:	200-01298-16007
DESN:	JDA
DRWN:	AMB
CHKD:	JO

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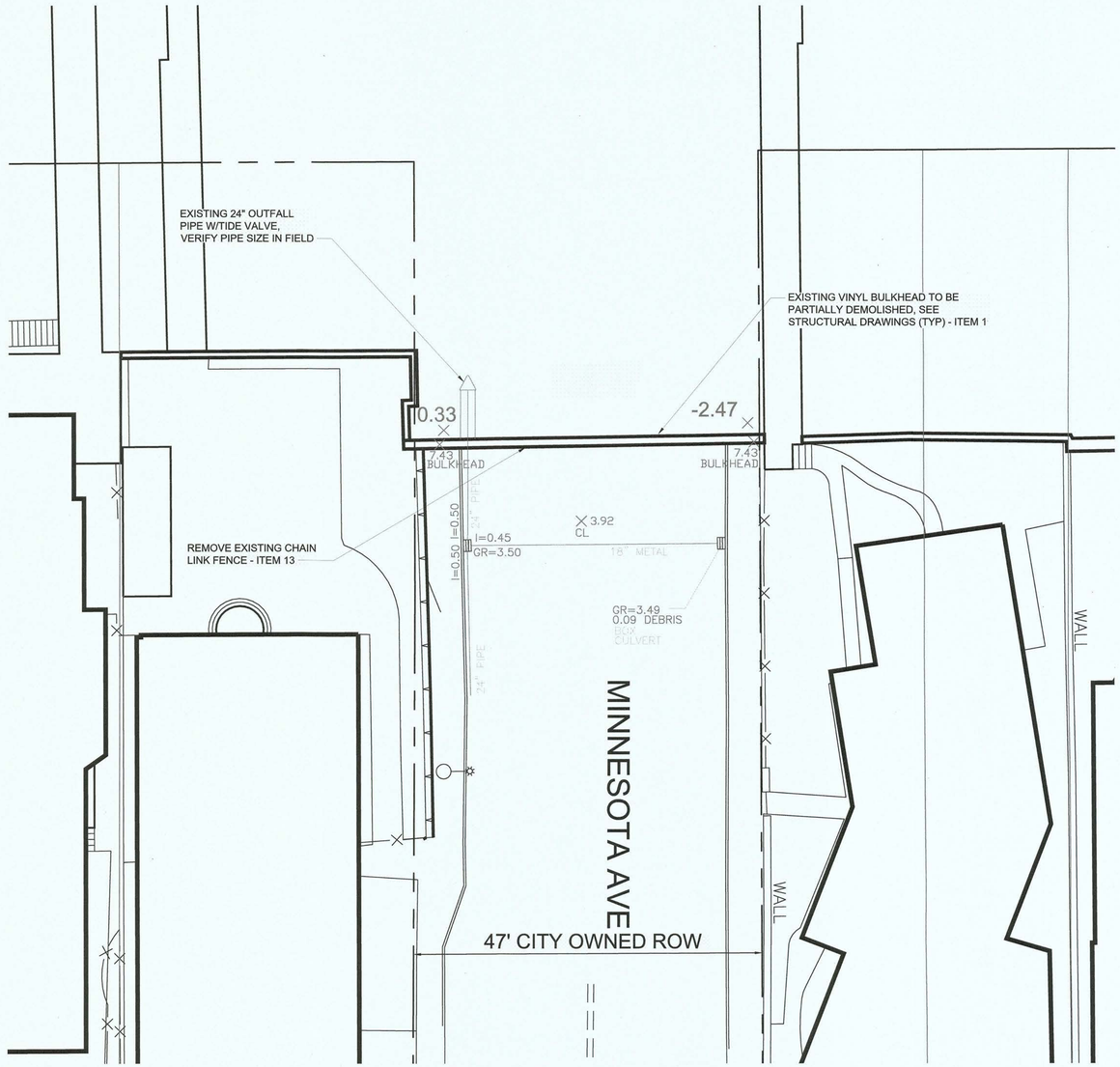
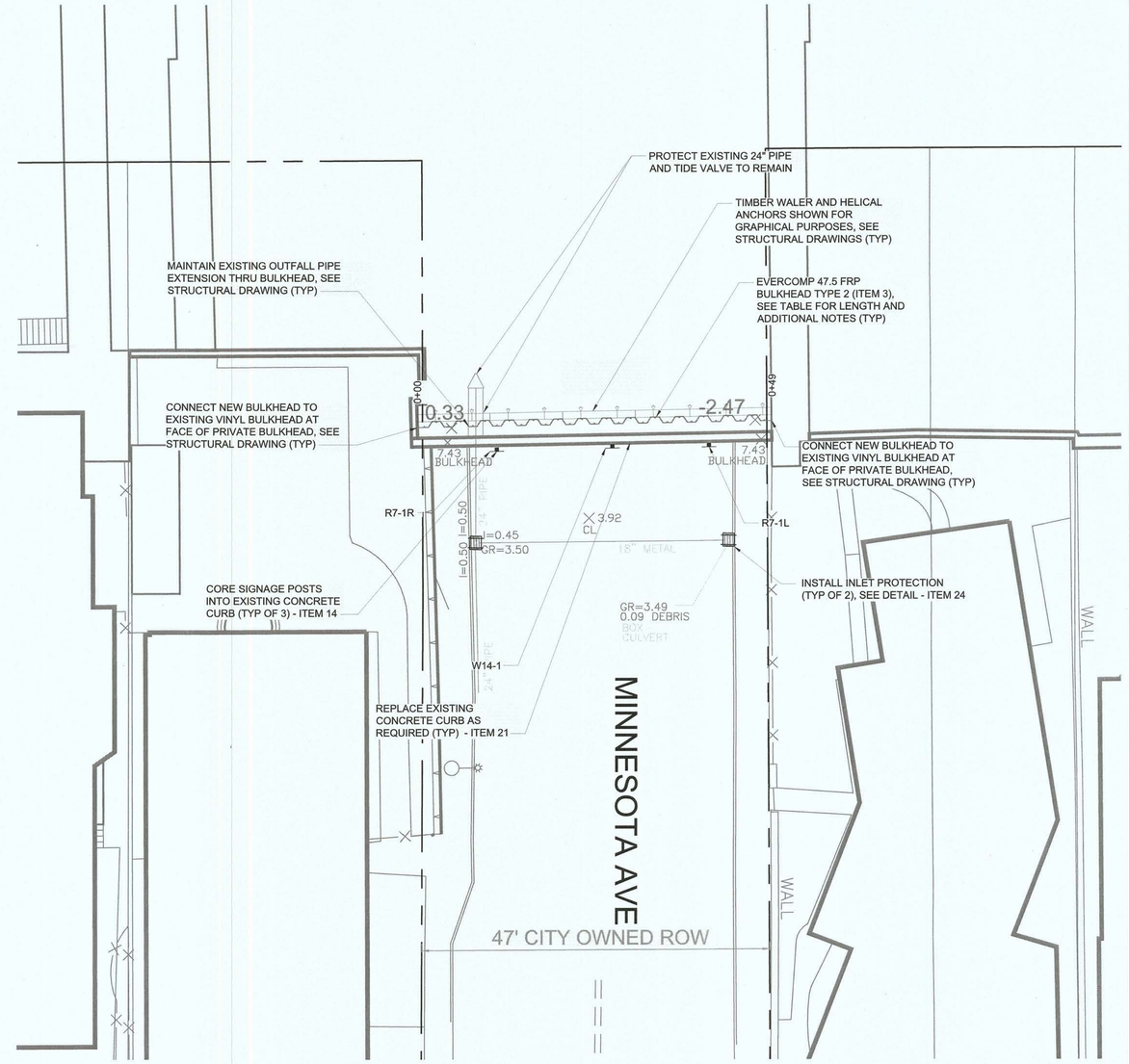


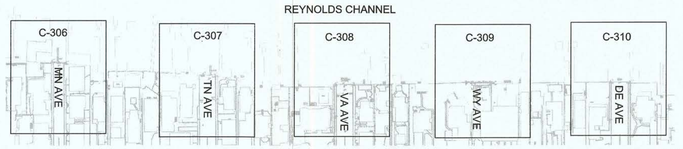
EXISTING CONDITIONS / DEMOLITION PLAN



PROPOSED CONDITIONS

NOTES:
1. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO PRIVATE HOMEOWNER'S FENCES DURING CONSTRUCTION
2. ALL SIGNAGE TO COMPLY W/ USDOT 2009 MUTCD DESIGN GUIDELINES

PROPOSED BULKHEAD DESCRIPTIONS - MINNESOTA AVE			
STATION		SHEET LENGTH (FT)	HELICAL ANCHORS
START	END		
0+00	0+49	20	6' OC



KEY MAP

SCALE: 1" = 200'

0 5 10 20
SCALE: 1" = 10'

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NORTH SHORE BULKHEAD PROJECT
MINNESOTA AVENUE BULKHEAD

PROJ:	200-01298-16007
DESN:	JDA
DRWN:	AMB
CHKD:	JO

C-306

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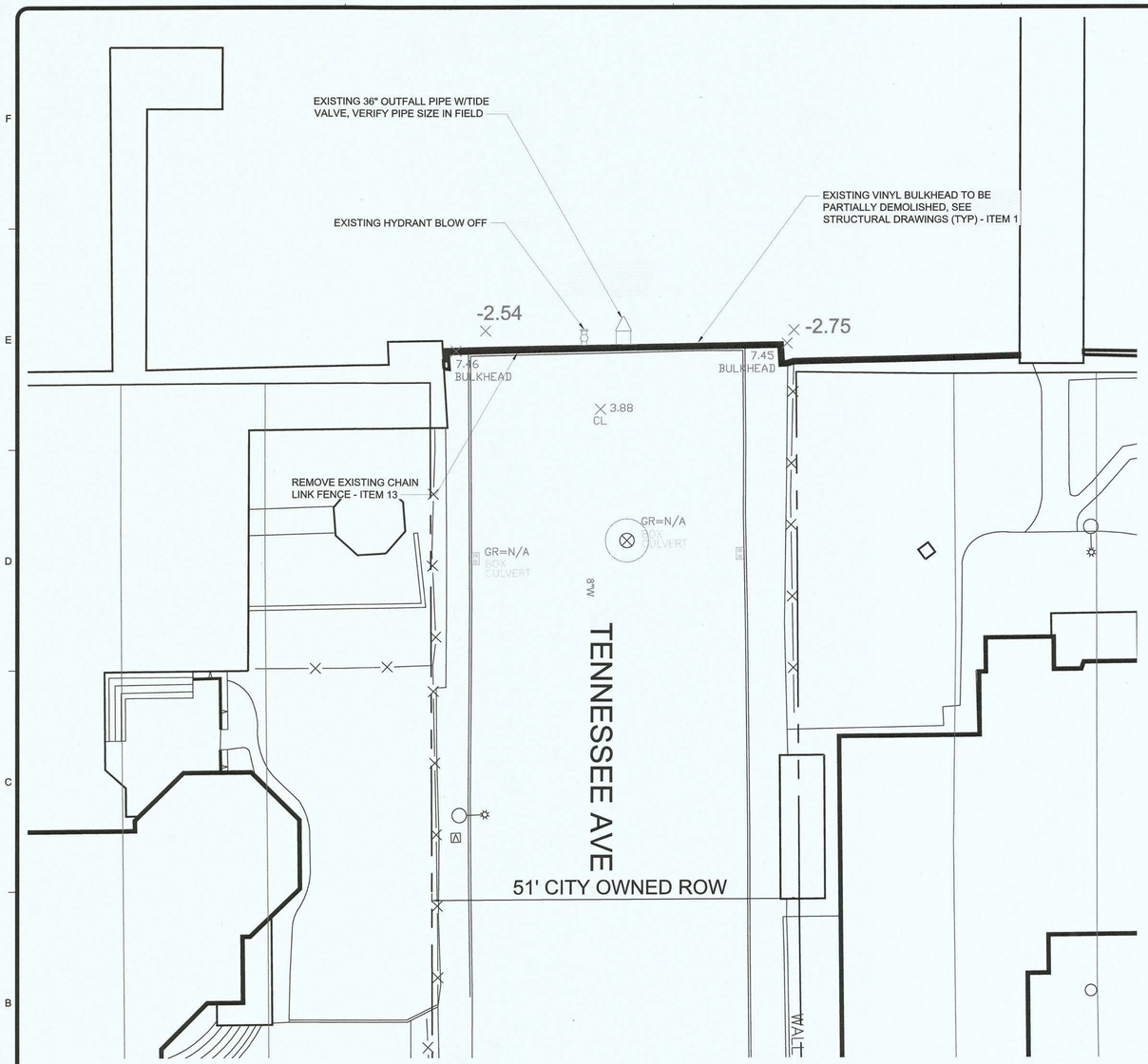
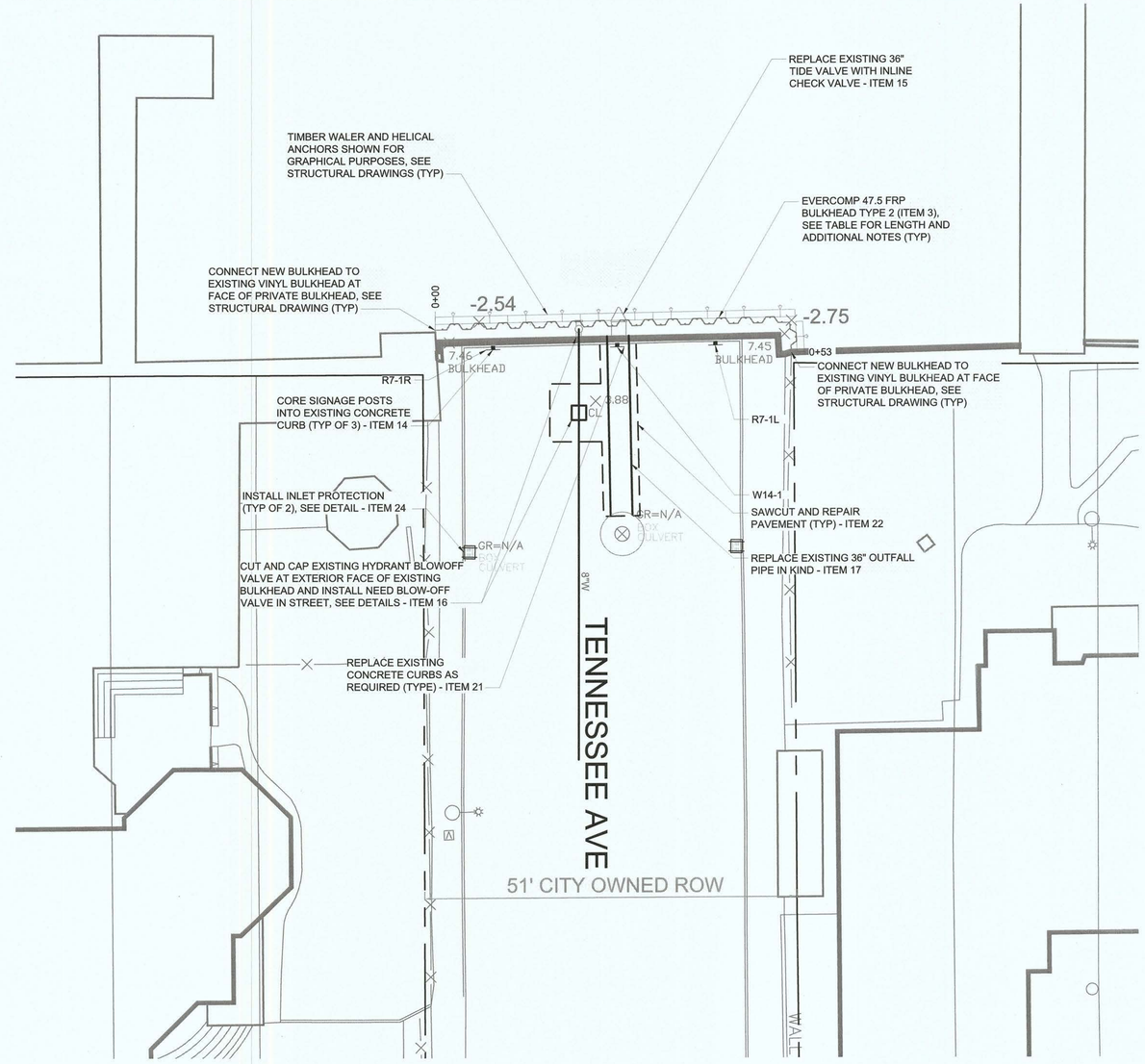


EXISTING CONDITIONS / DEMOLITION PLAN

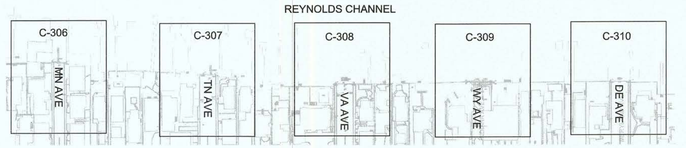


PROPOSED CONDITIONS

NOTES:
1. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO PRIVATE HOMEOWNER'S FENCES DURING CONSTRUCTION
2. ALL SIGNAGE TO COMPLY W/ USDOT 2009 MUTCD DESIGN GUIDELINES

PROPOSED BULKHEAD DESCRIPTIONS - TENNESSEE AVE

STATION		SHEET LENGTH (FT)	HELICAL ANCHORS
START	END		
0+00	0+53	20	6' OC



KEY MAP

SCALE: 1" = 200'

0 5 10 20
SCALE: 1" = 10'

N

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CITY OF LONG BEACH
NORTH SHORE BULKHEAD PROJECT
TENNESSEE AVENUE BULKHEAD

PROJ:	200-01298-16007
DESN:	JDA
DRWN:	AMB
CHKD:	JO

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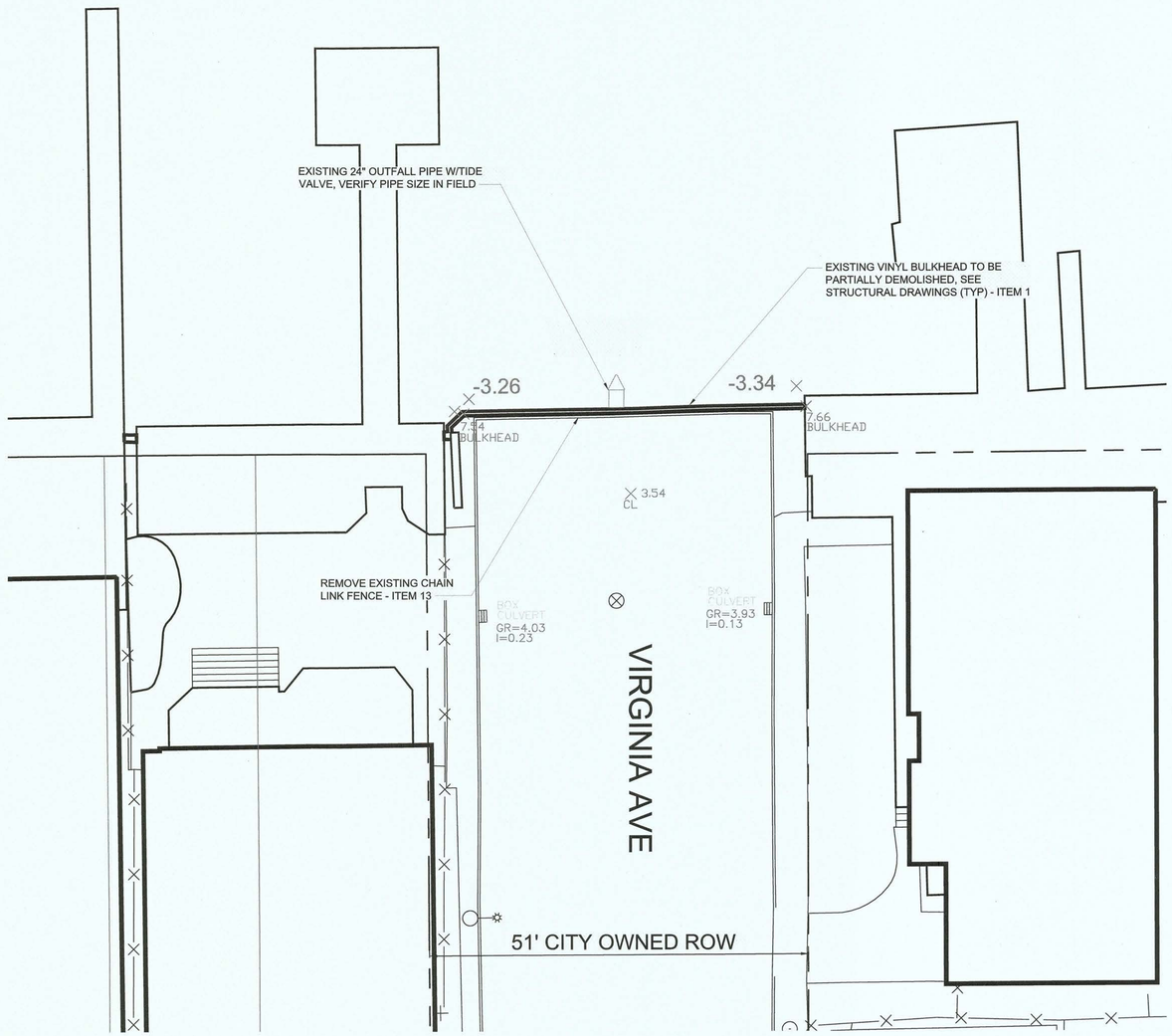
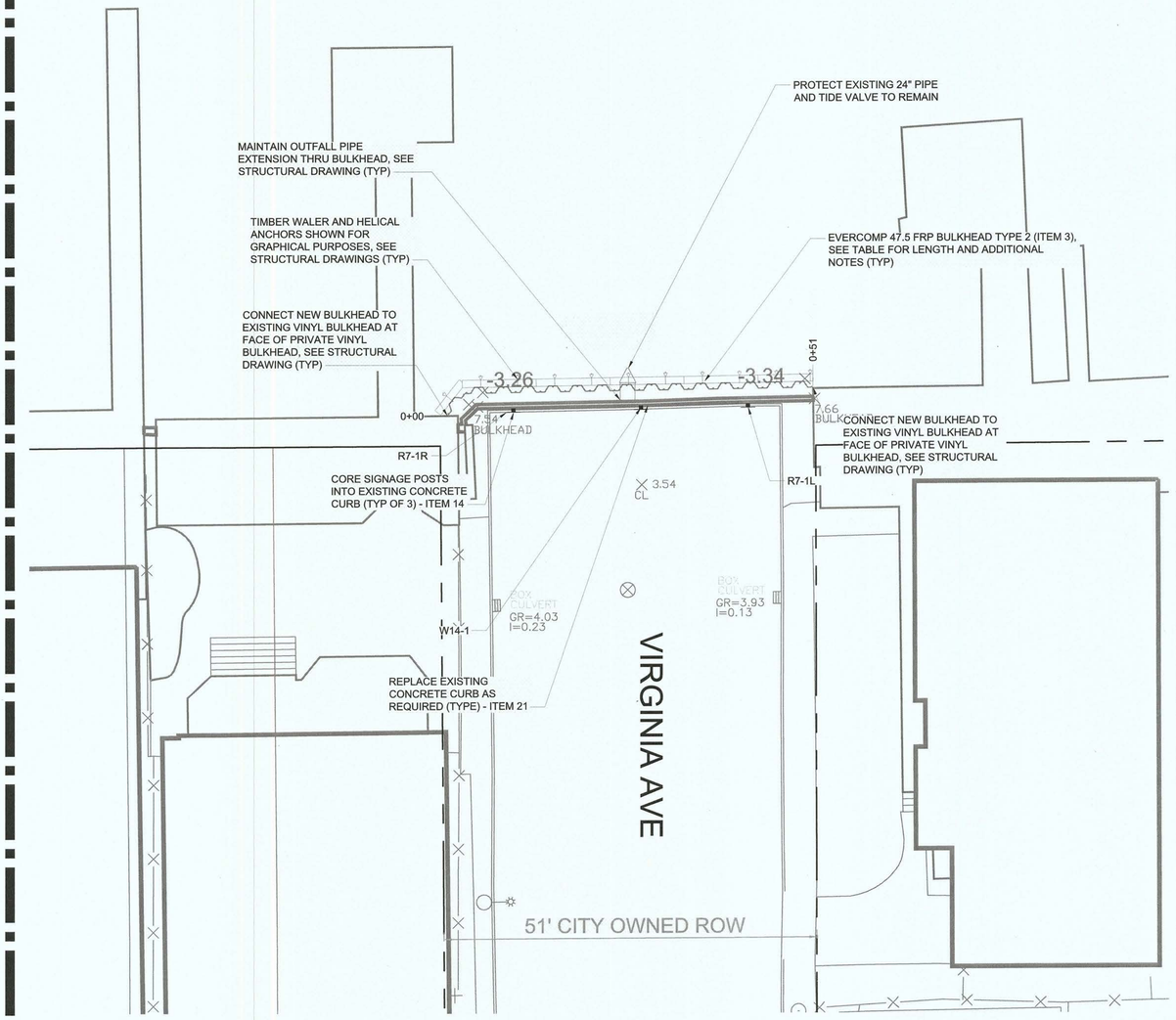


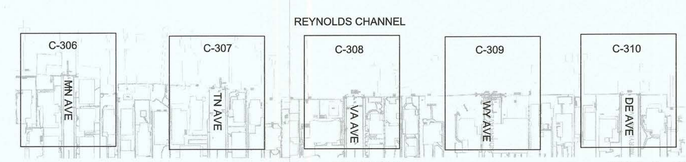
EXISTING CONDITIONS / DEMOLITION PLAN



PROPOSED CONDITIONS

NOTES:
1. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO PRIVATE HOMEOWNER'S FENCES DURING CONSTRUCTION
2. ALL SIGNAGE TO COMPLY W/ USDOT 2009 MUTCD DESIGN GUIDELINES

PROPOSED BULKHEAD DESCRIPTIONS - VIRGINIA AVE			
STATION		SHEET LENGTH (FT)	HELICAL ANCHORS
START	END		
0+00	0+51	21	6' OC



KEY MAP

SCALE: 1" = 200'

0 5 10 20
SCALE: 1" = 10'

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CITY OF LONG BEACH
NORTH SHORE BULKHEAD PROJECT
VIRGINIA AVENUE BULKHEAD

PROJ:	200-01298-16007
DESN:	JDA
DRWN:	AMB
CHKD:	JO

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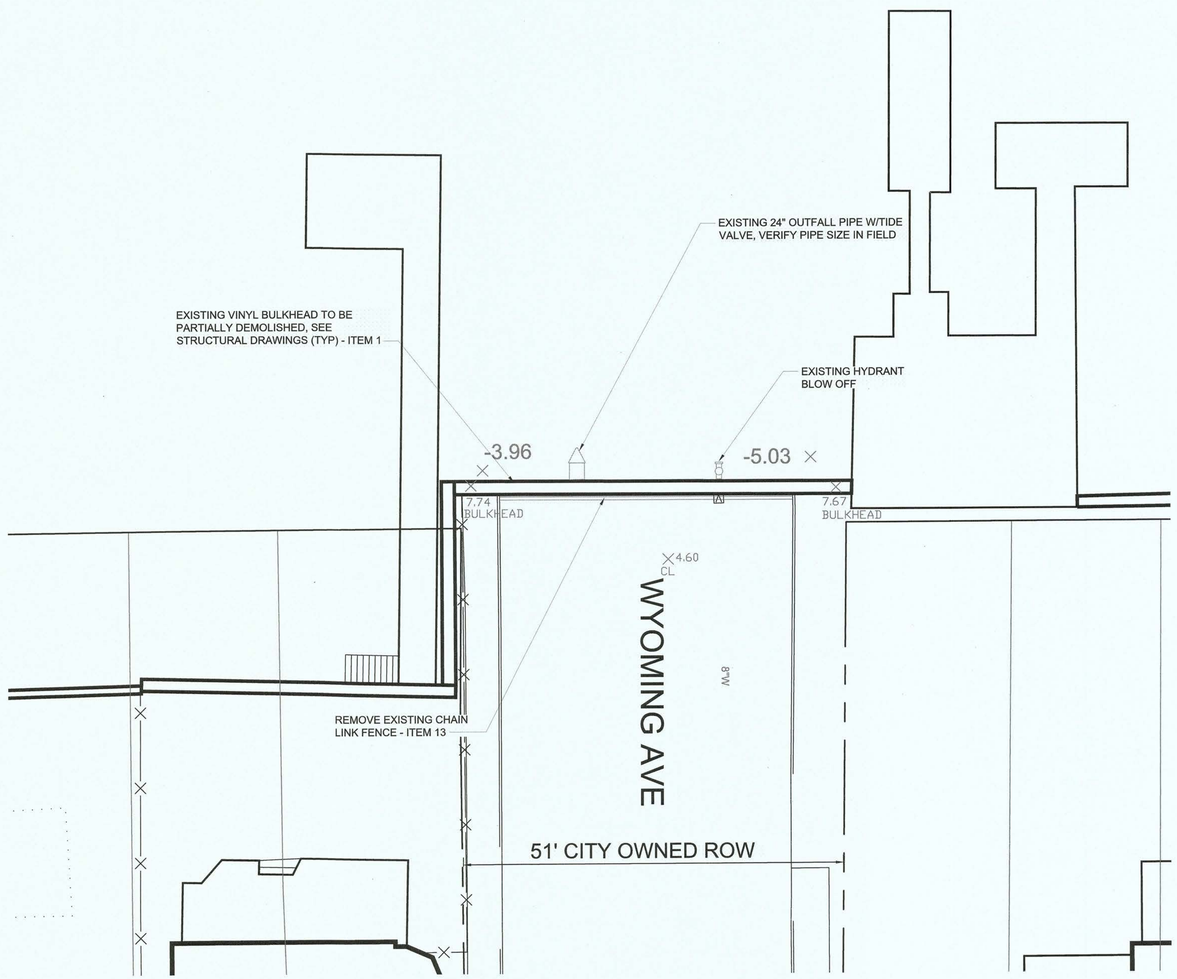
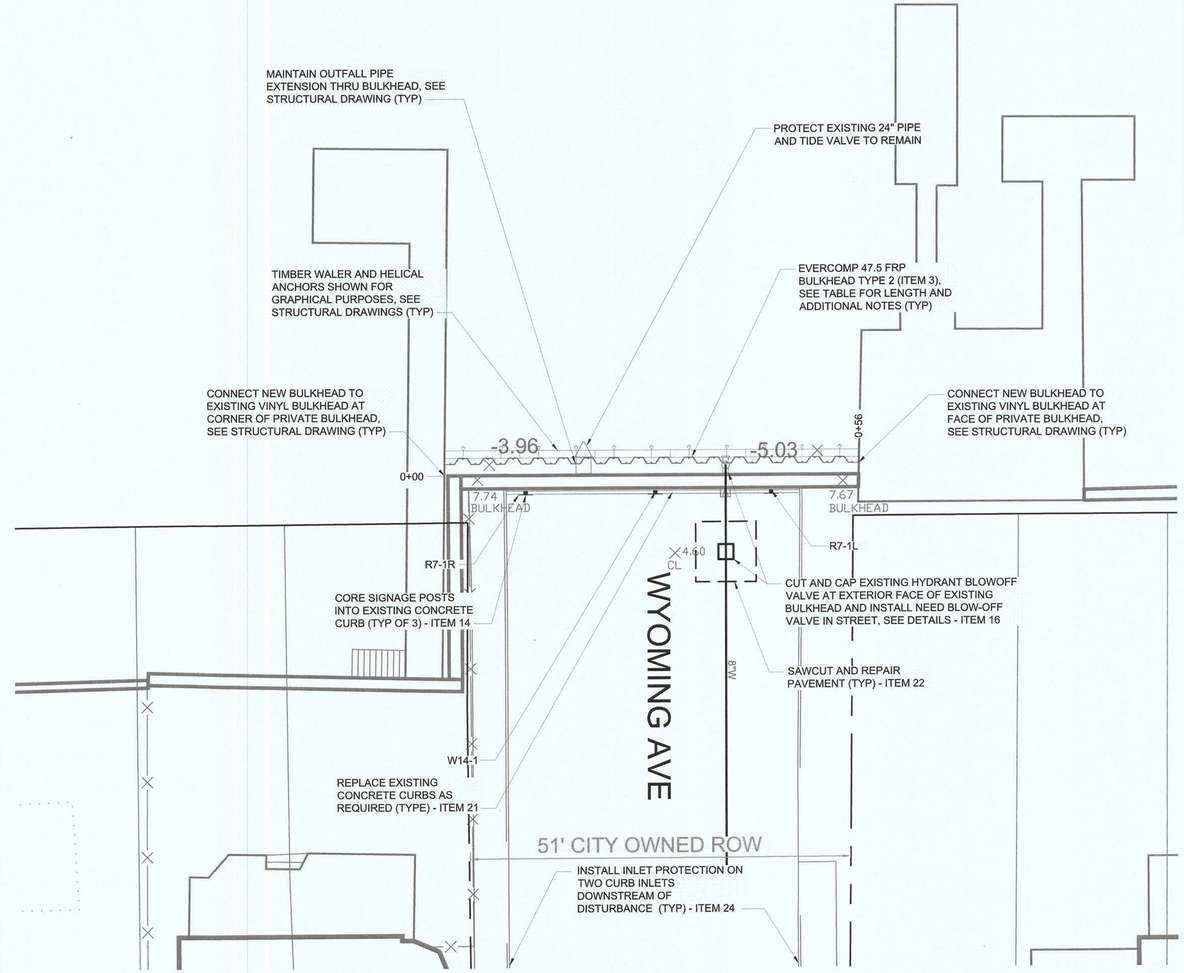


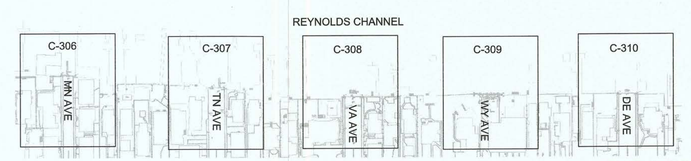
EXISTING CONDITIONS / DEMOLITION PLAN



PROPOSED CONDITIONS

NOTES:
1. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO PRIVATE HOMEOWNER'S FENCES DURING CONSTRUCTION
2. ALL SIGNAGE TO COMPLY W/ USDOT 2009 MUTCD DESIGN GUIDELINES

PROPOSED BULKHEAD DESCRIPTIONS - WYOMING AVE			
STATION		SHEET LENGTH (FT)	HELICAL ANCHORS
START	END		
0+00	0+56	23	5' OC



KEY MAP

SCALE: 1" = 200'

0 5 10 20
SCALE: 1" = 10'

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CITY OF LONG BEACH
NORTH SHORE BULKHEAD PROJECT
WYOMING AVENUE BULKHEAD

PROJ:	200-01298-16007
DESN:	JDA
DRWN:	AMB
CHKD:	JO

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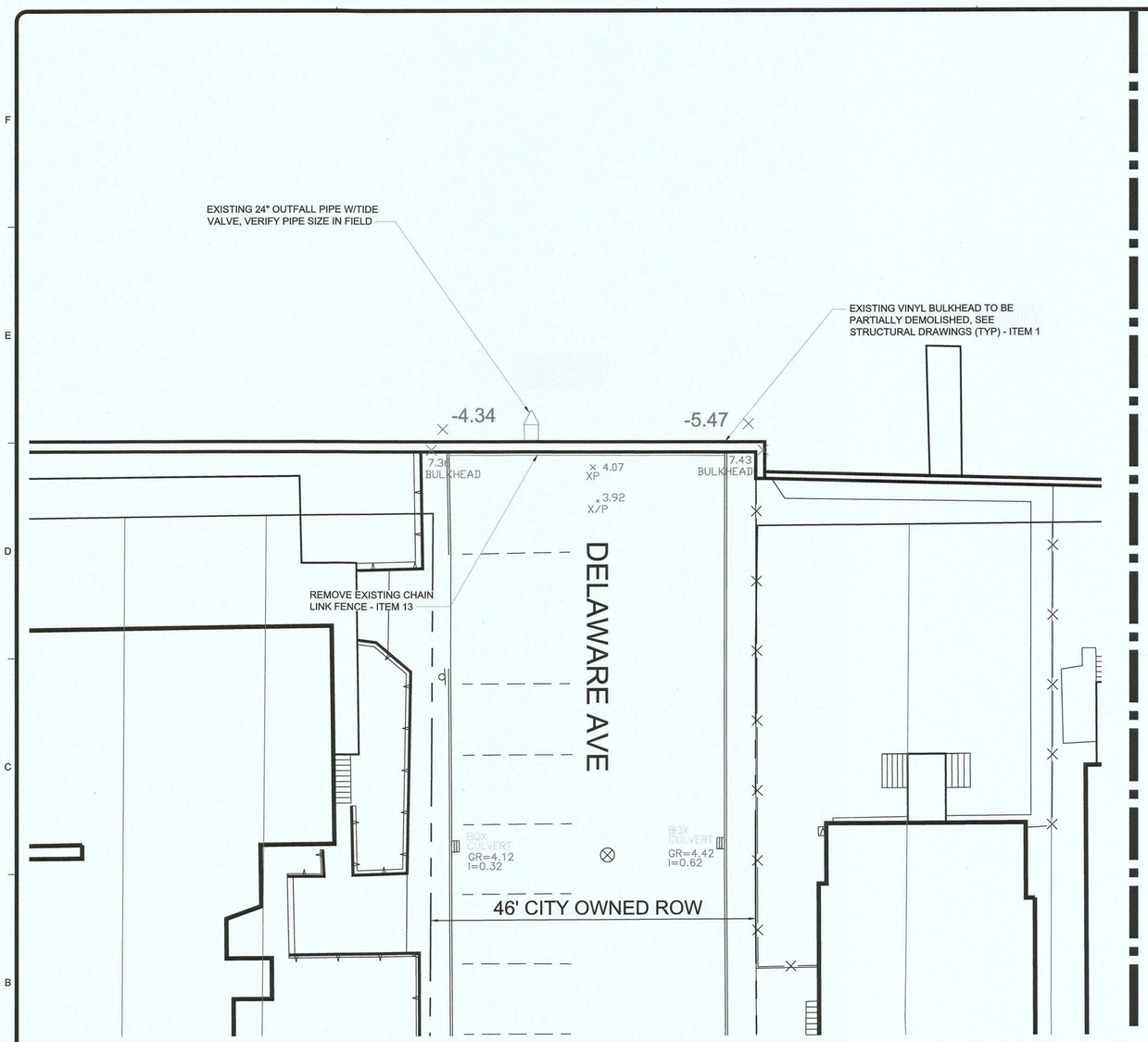
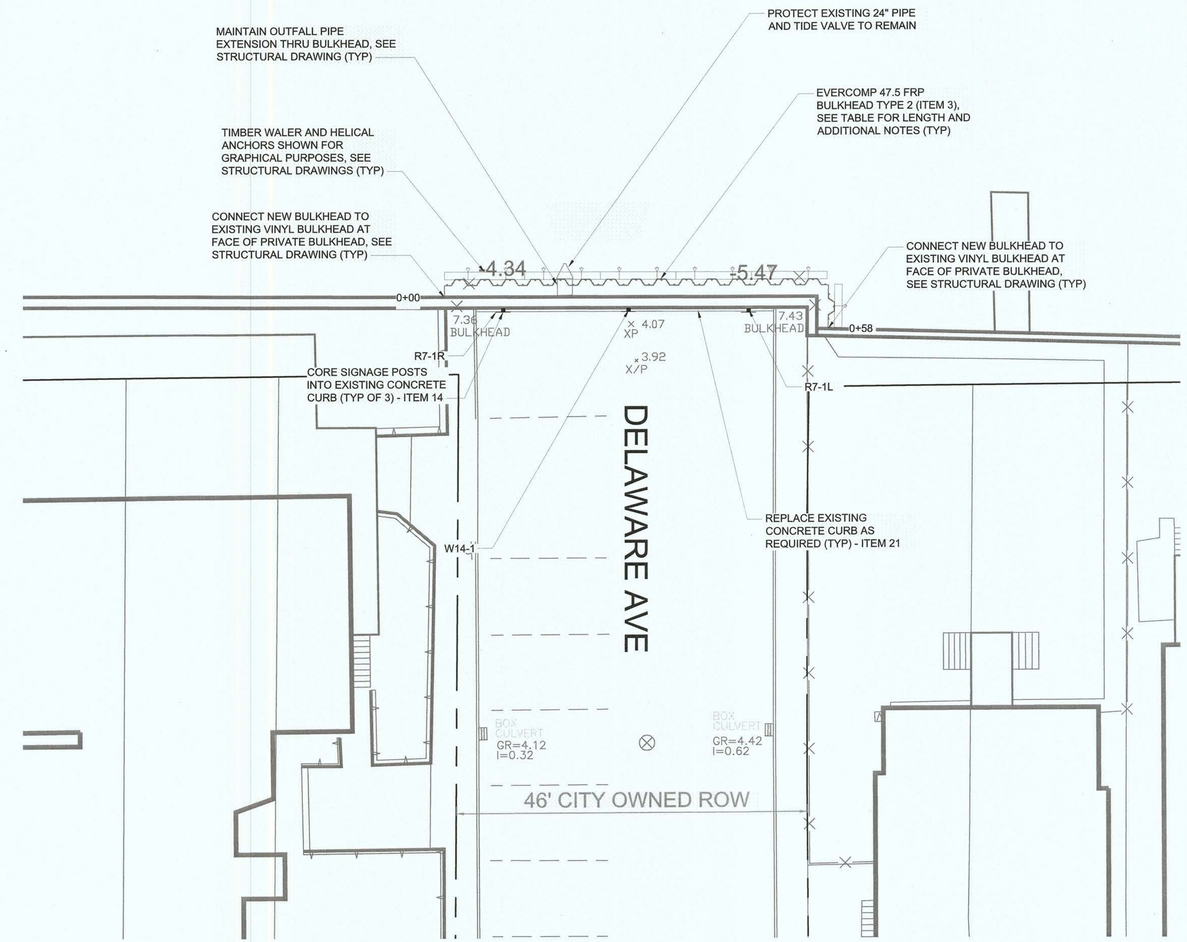


EXISTING CONDITIONS / DEMOLITION PLAN



PROPOSED CONDITIONS

NOTES:
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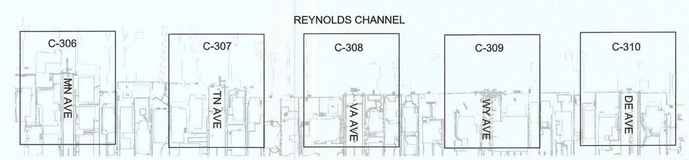
2. ALL SIGNAGE TO COMPLY W/ USDOT 2009 MUTCD DESIGN GUIDELINES

PROPOSED BULKHEAD DESCRIPTIONS - DELAWARE AVE			
STATION		SHEET LENGTH (FT)	HELICAL ANCHORS
START	END		
0+00	0+58	23	5' OC



KEY MAP

SCALE: 1" = 200'

0 5 10 20
SCALE: 1" = 10'

N

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MARK	DATE	DESCRIPTION	BY
	08/08/19	100% BID DOCUMENTS	ATC

CITY OF LONG BEACH
NORTH SHORE BULKHEAD PROJECT

DELAWARE AVENUE BULKHEAD

PROJ:	200-01298-16007
DESN:	JDA
DRWN:	AMB
CHKD:	JO

C-310

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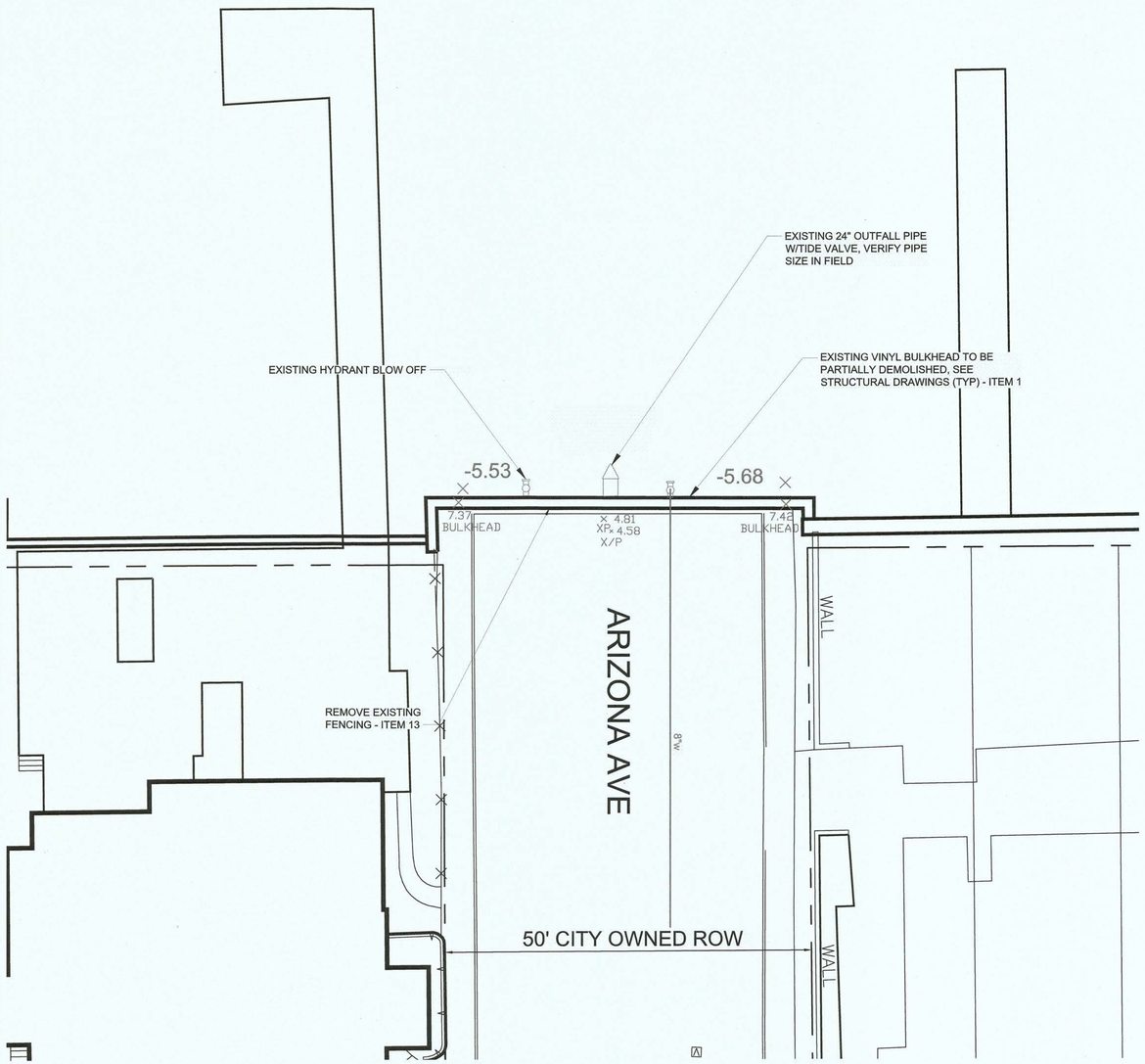
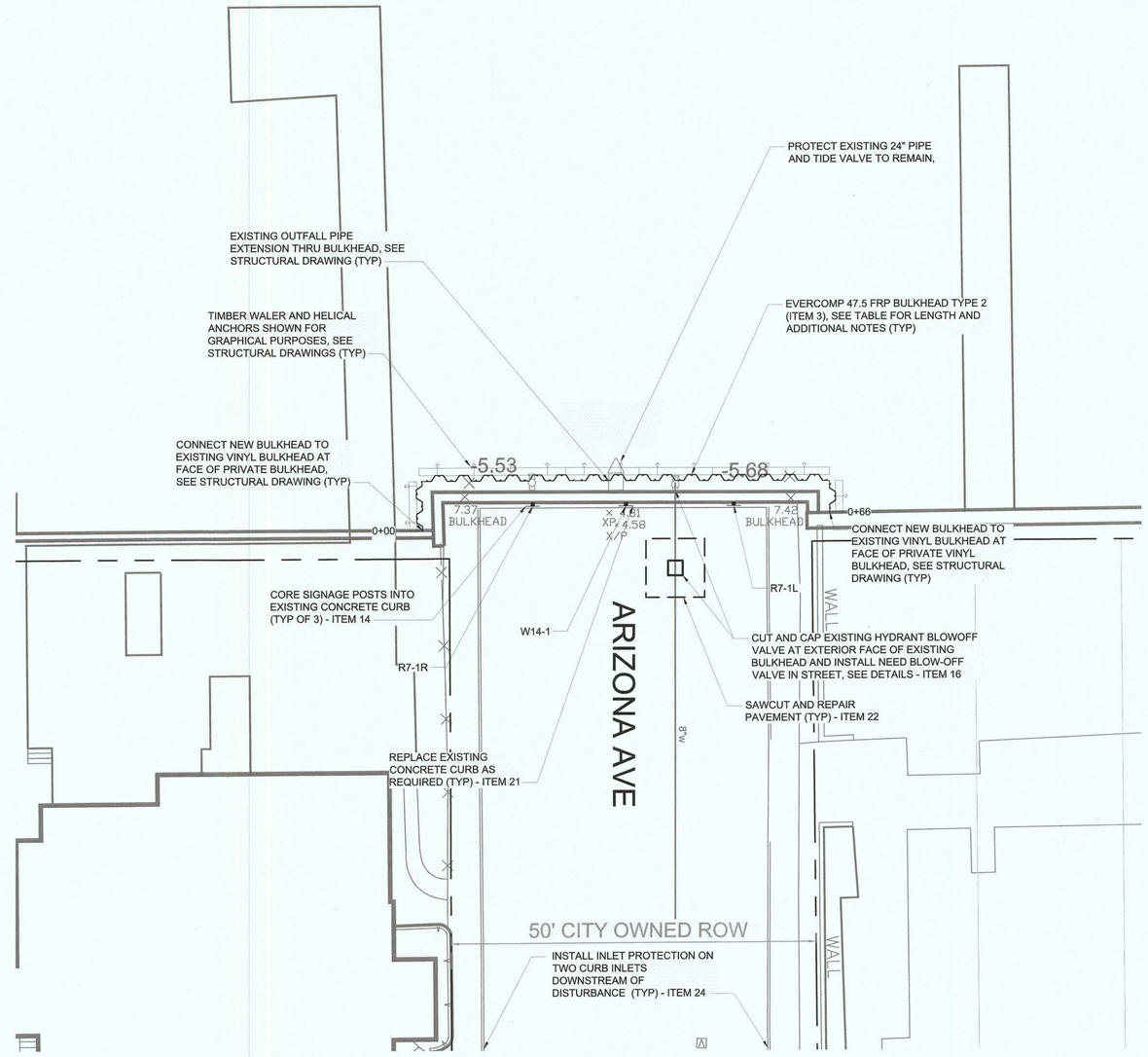


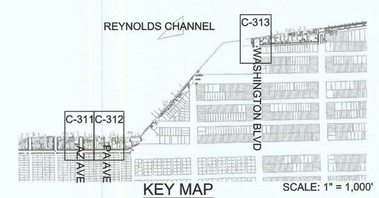
EXISTING CONDITIONS / DEMOLITION PLAN



PROPOSED CONDITIONS

NOTES:
1. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO PRIVATE HOMEOWNER'S FENCES DURING CONSTRUCTION
2. ALL SIGNAGE TO COMPLY W/ USDOT 2009 MUTCD DESIGN GUIDELINES

PROPOSED BULKHEAD DESCRIPTIONS - ARIZONA AVE			
STATION		SHEET LENGTH (FT)	HELICAL ANCHORS
START	END		
0+00	0+66	23	5' OC



KEY MAP

SCALE: 1" = 10'

SCALE: 1" = 1,000'

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CITY OF LONG BEACH
NORTH SHORE BULKHEAD PROJECT
ARIZONA AVENUE BULKHEAD

PROJ:	200-01298-16007
DESN:	JDA
DRWN:	AMB
CHKD:	JO

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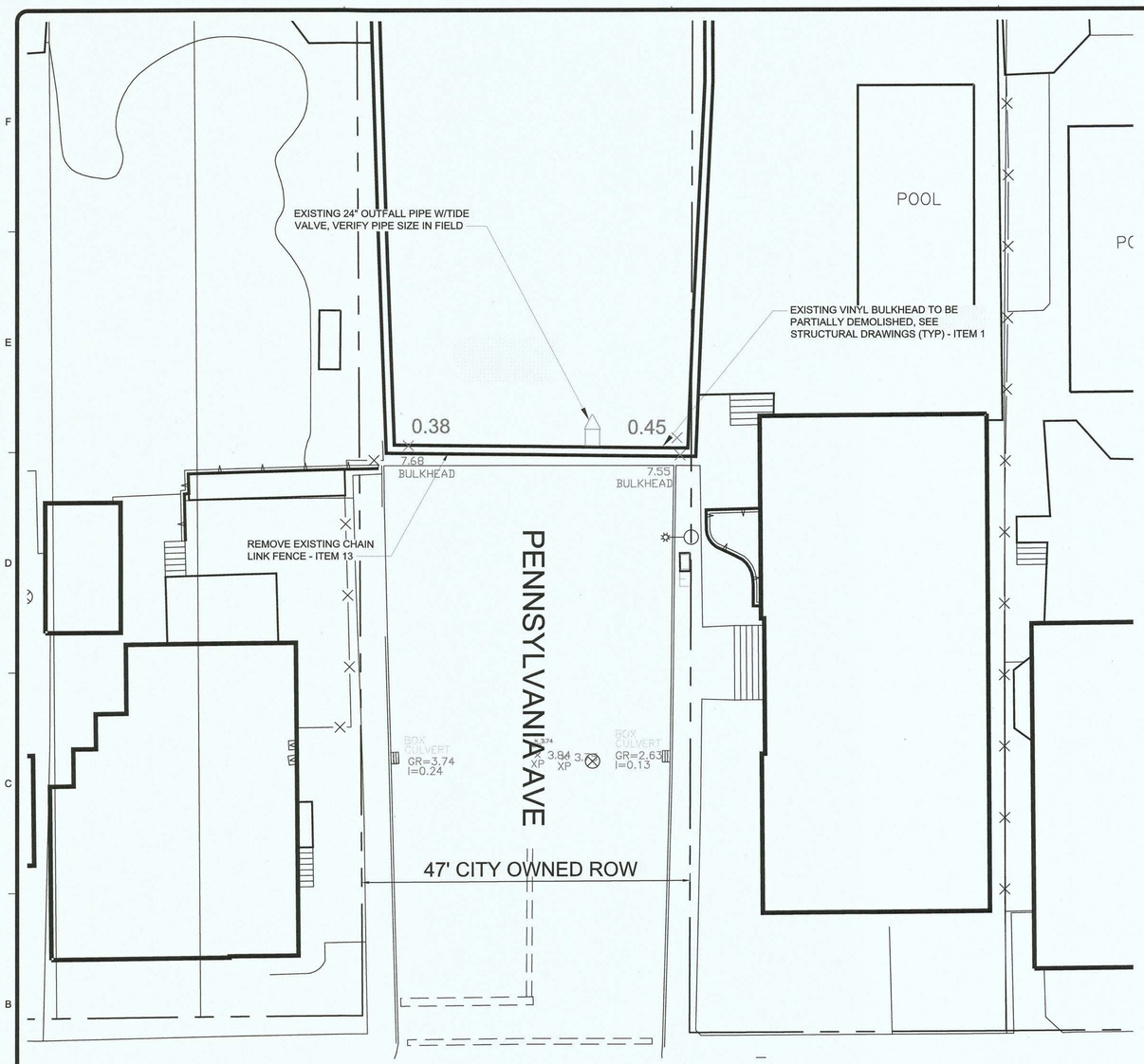
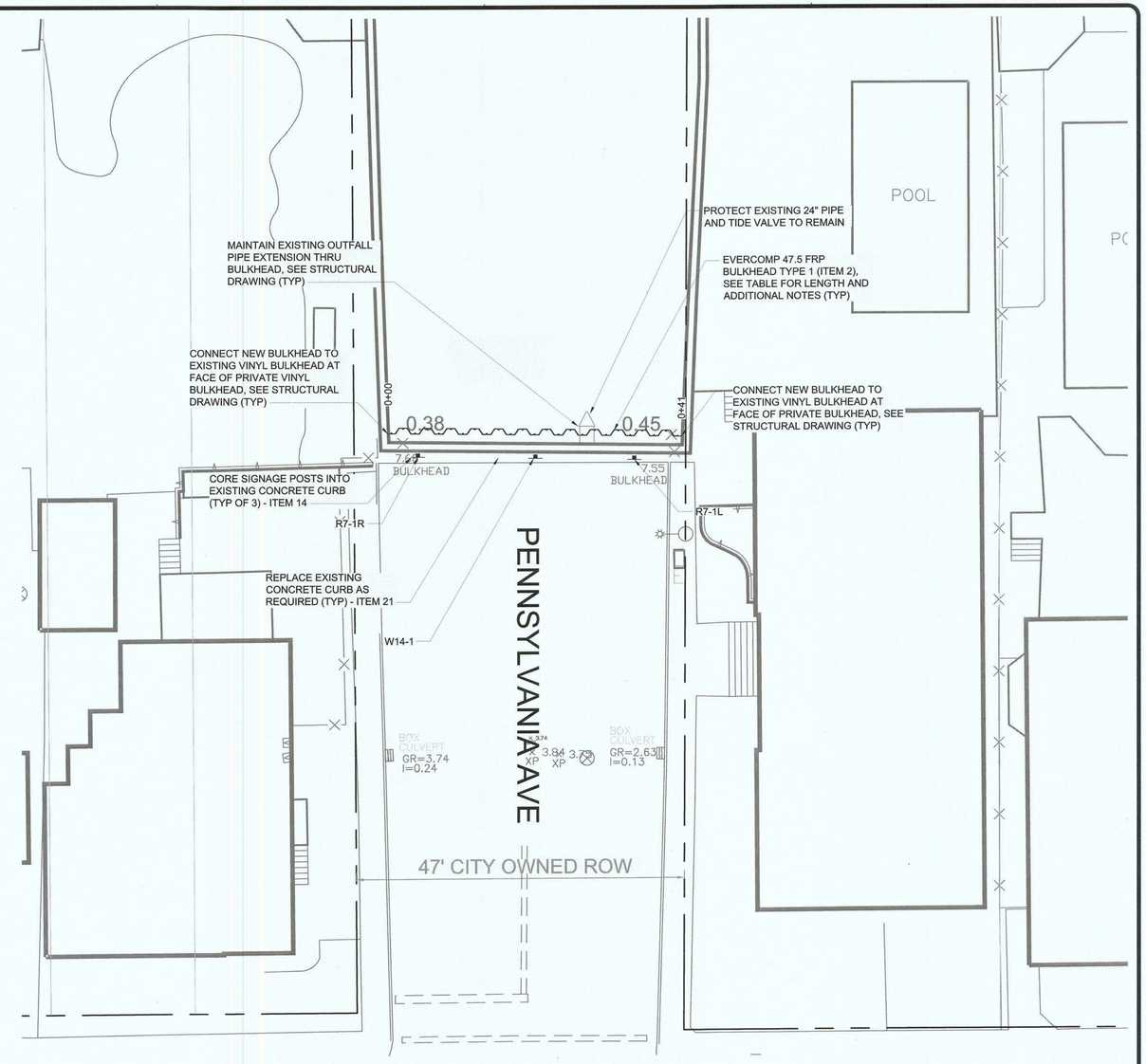


EXISTING CONDITIONS / DEMOLITION PLAN

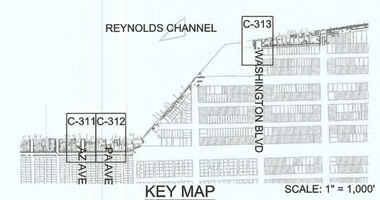


PROPOSED CONDITIONS

NOTES:
1. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO PRIVATE HOMEOWNER'S FENCES DURING CONSTRUCTION
2. ALL SIGNAGE TO COMPLY W/ USDOT 2009 MUTCD DESIGN GUIDELINES

PROPOSED BULKHEAD DESCRIPTIONS - PENNSYLVANIA AVE

STATION		SHEET LENGTH (FT)	HELICAL ANCHORS
START	END		
0+00	0+41	23	-



KEY MAP SCALE: 1" = 1,000'

0 5 10 20
SCALE: 1" = 10'

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CITY OF LONG BEACH
NORTH SHORE BULKHEAD PROJECT
PENNSYLVANIA AVENUE BULKHEAD

PROJ:	200-01298-16007
DESN:	JDA
DRWN:	AMB
CHKD:	JO

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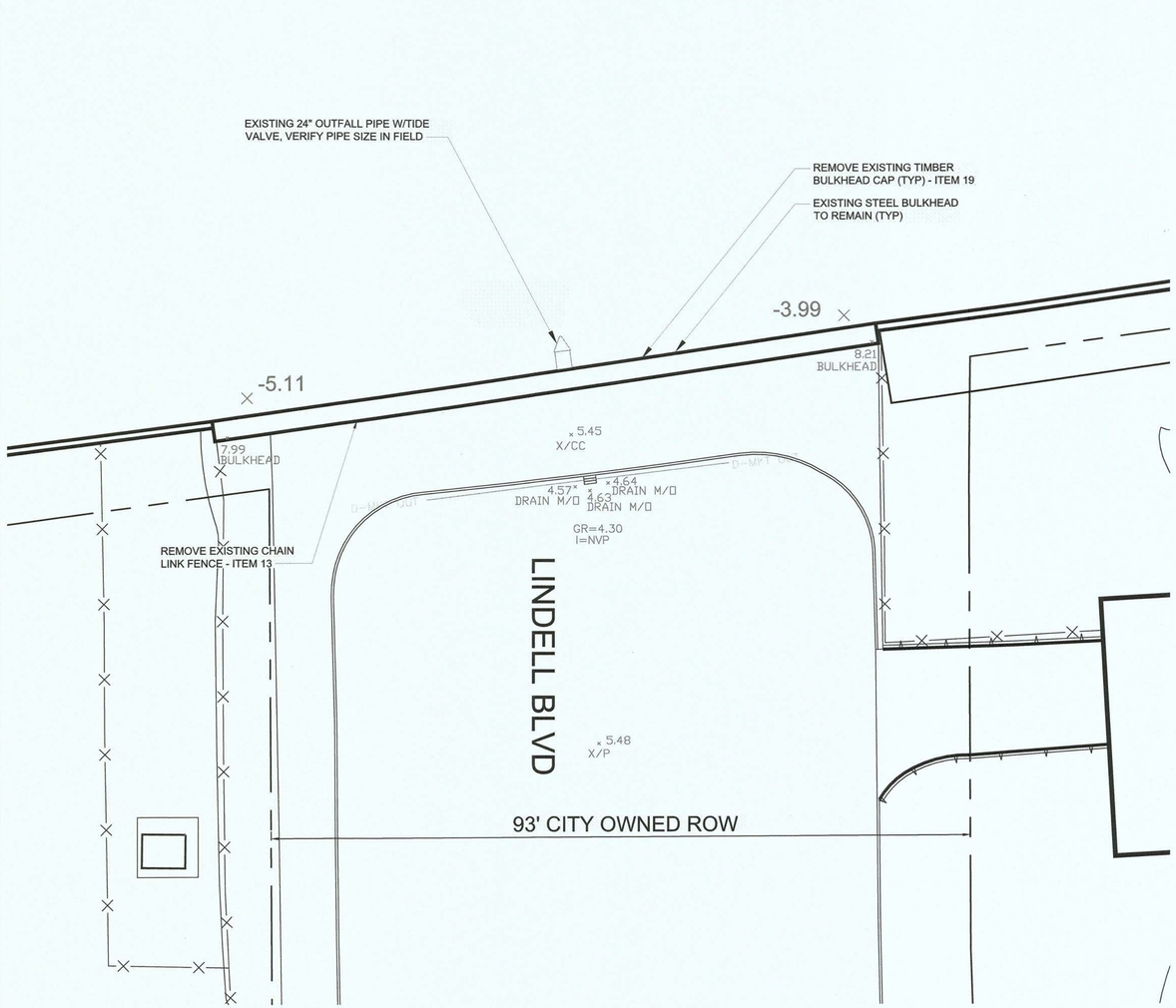
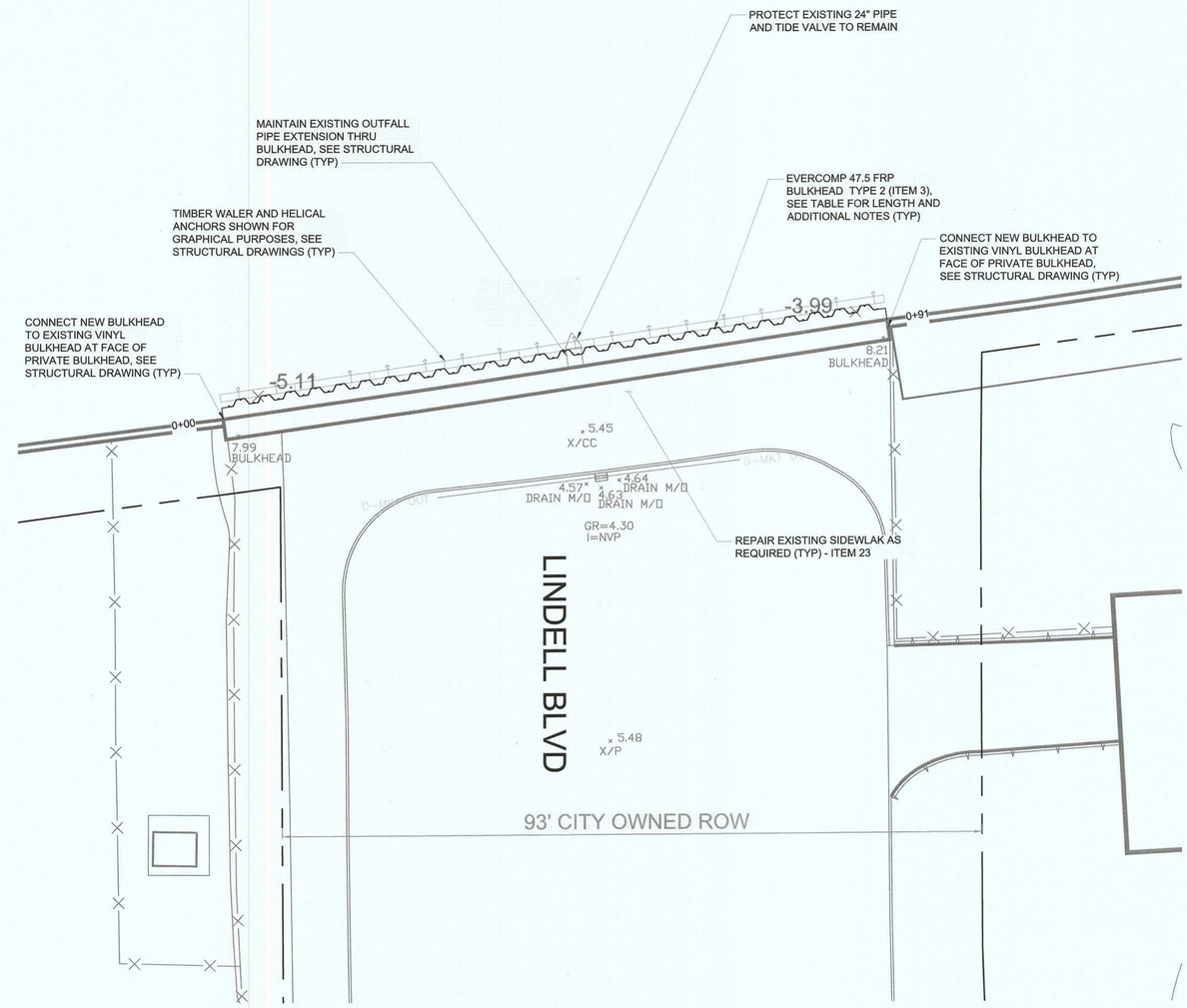


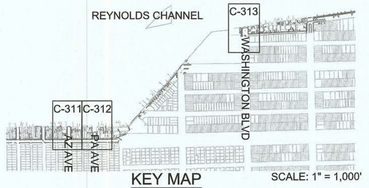
EXISTING CONDITIONS / DEMOLITION PLAN



PROPOSED CONDITIONS

NOTES:
1. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO PRIVATE HOMEOWNER'S FENCES DURING CONSTRUCTION
2. ALL SIGNAGE TO COMPLY W/ USDOT 2009 MUTCD DESIGN GUIDELINES

PROPOSED BULKHEAD DESCRIPTIONS - LINDELL BOULEVARD			
STATION		SHEET LENGTH (FT)	HELICAL ANCHORS
START	END		
0+00	0+91	23	5' OC



KEY MAP SCALE: 1" = 1,000'

0 5 10 20
SCALE: 1" = 10'

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CITY OF LONG BEACH
NORTH SHORE BULKHEAD PROJECT
LINDELL BOULEVARD BULKHEAD

PROJ:	200-01298-16007
DESN:	JDA
DRWN:	AMB
CHKD:	JO

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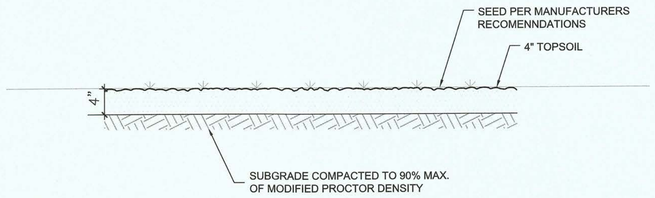
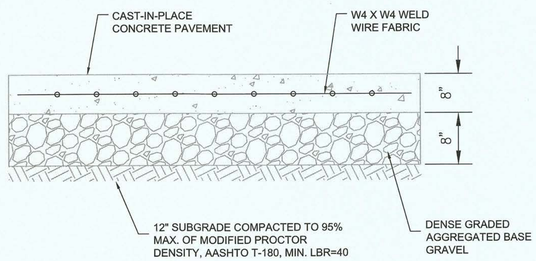
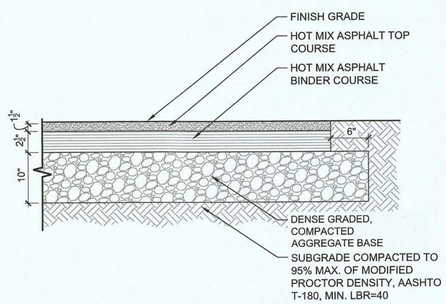


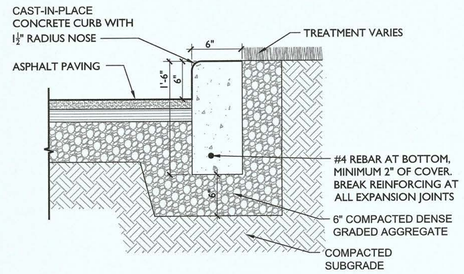
1 LOAM AND SEED - ITEM 9
N.T.S. SECTION



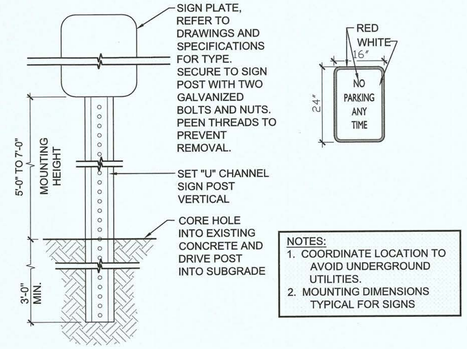
2 CONCRETE SIDEWALK - ITEM 23
N.T.S. SECTION



5 ASPHALT PAVEMENT - ITEM 22
N.T.S. SECTION

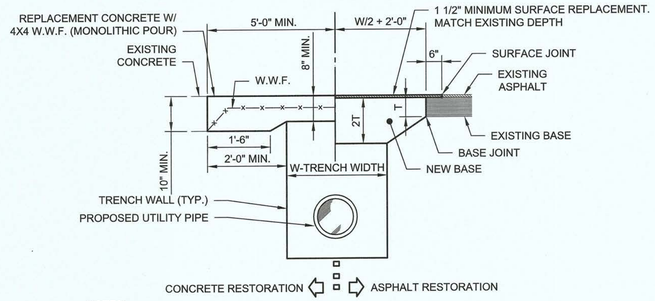


4 CONCRETE CURB - ITEM 21
N.T.S. SECTION



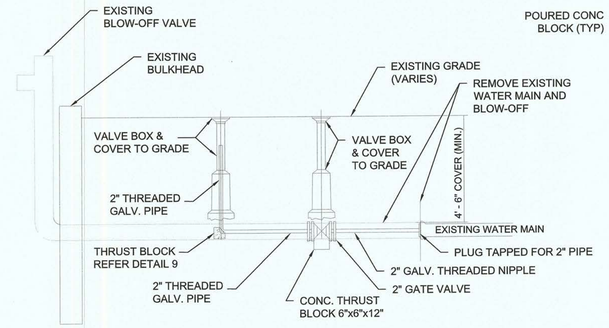
NOTES:
1. COORDINATE LOCATION TO AVOID UNDERGROUND UTILITIES.
2. MOUNTING DIMENSIONS TYPICAL FOR SIGNS

5 TRAFFIC SIGN - ITEM 14
N.T.S. SECTION



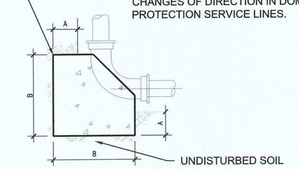
NOTES:
1. SURFACE AND BASE CUTS SHALL BE SAW-CUT.
2. LONGITUDINAL OR DIAGONAL CUTS REQUIRE OVERLAY/RESURFACING COMPLETE WIDTH OF ROAD.
3. CUTS AT INTERSECTIONS REQUIRE COMPLETE OVERLAY/RESURFACING TO END OF ALL RETURN RADS AND/OR 10'FT. BEYOND CUT, WHICH EVER IS GREATER.

6 TRENCH PATCH DETAIL - ITEM 17
N.T.S. SECTION



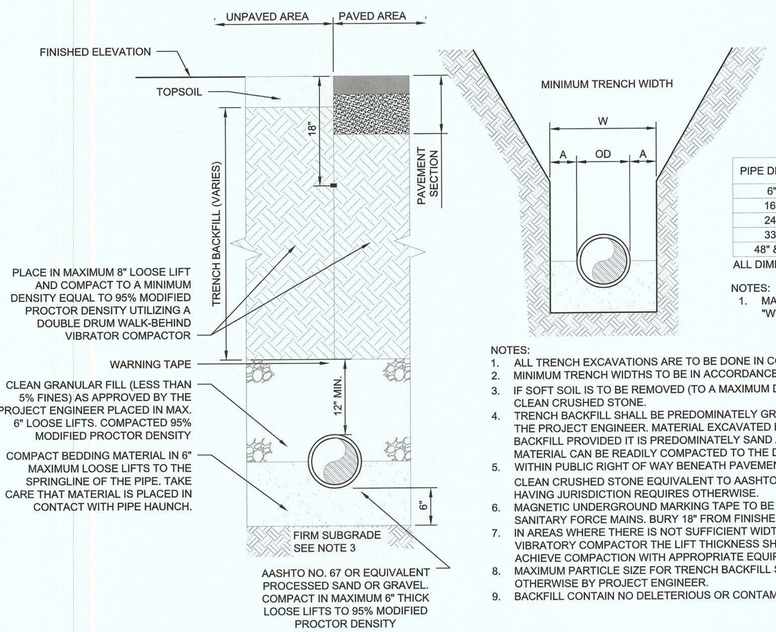
7 CITY OF LONG BEACH HYDRANT BLOW-OFF - ITEM 16
N.T.S. SECTION

NOTES:
1. DETAIL FOR BOTH VERTICALLY AND HORIZONTALLY LAID PIPE
2. CLASS 3,000 CONCRETE POURED IN PLACE
3. LEAVE JOINTS CLEAR OF CONCRETE FOR EASY ACCESS
4. PROVIDE THRUST BLOCKS (REACTION BACKING) AT CHANGES OF DIRECTION IN DOMESTIC AND FIRE PROTECTION SERVICE LINES.



BLOCKING FOR PIPING			
PIPE SIZE	A	B	DEPTH
2"	6" MIN	7"	12" MIN

9 THRUST BLOCK DETAIL
N.T.S. SECTION



PIPE DIAMETER "D"	MAXIMUM "A"
6" TO 15"	8"
16" TO 21"	10"
24" TO 30"	12"
33" TO 42"	15"
48" & LARGER	18"

ALL DIMENSIONS IN INCHES

NOTES:
1. MAXIMUM TRENCH WIDTH "W" TAKEN AT TOP OF PIPE.

NOTES:
1. ALL TRENCH EXCAVATIONS ARE TO BE DONE IN COMPLIANCE WITH OSHA REGULATIONS.
2. MINIMUM TRENCH WIDTHS TO BE IN ACCORDANCE WITH THE CHART ABOVE.
3. IF SOFT SOIL IS TO BE REMOVED (TO A MAXIMUM DEPTH OF 2 FT) AND REPLACED WITH ¾" CLEAN CRUSHED STONE.
4. TRENCH BACKFILL SHALL BE PREDOMINATELY GRANULAR FILL MATERIAL AS APPROVED BY THE PROJECT ENGINEER. MATERIAL EXCAVATED FROM THE TRENCH MAY BE SUED FOR BACKFILL PROVIDED IT IS PREDOMINATELY SAND AND IS AT WATER CONTENT THAT THE MATERIAL CAN BE READILY COMPACTED TO THE DENSITY REQUIRED.
5. WITHIN PUBLIC RIGHT OF WAY BENEATH PAVEMENT, THE BACKFILL MATERIAL SHALL BE CLEAN CRUSHED STONE EQUIVALENT TO AASHTO NO. 67 OR ¾" STONE, UNLESS AUTHORITY HAVING JURISDICTION REQUIRES OTHERWISE.
6. MAGNETIC UNDERGROUND MARKING TAPE TO BE PROVIDED FOR PLASTIC WATER, AND SANITARY FORCE MAINS. BURY 18" FROM FINISHED GRADE.
7. IN AREAS WHERE THERE IS NOT SUFFICIENT WIDTH FOR A DOUBLE DRUM WALK BEHIND VIBRATORY COMPACTOR THE LIFT THICKNESS SHALL BE DECREASED AS NECESSARY TO ACHIEVE COMPACTION WITH APPROPRIATE EQUIPMENT.
8. MAXIMUM PARTICLE SIZE FOR TRENCH BACKFILL SHALL BE 4 INCHES UNLESS APPROVED OTHERWISE BY PROJECT ENGINEER.
9. BACKFILL CONTAIN NO DELETERIOUS OR CONTAMINATED MATERIAL.

8 UTILITY PIPE TRENCH
N.T.S. SECTION

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CITY OF LONG BEACH
NORTH SHORE BULKHEAD PROJECT
CIVIL DETAILS

PROJ:	200-01298-16007
DESN:	JDA
DRWN:	AMB
CHKD:	JO

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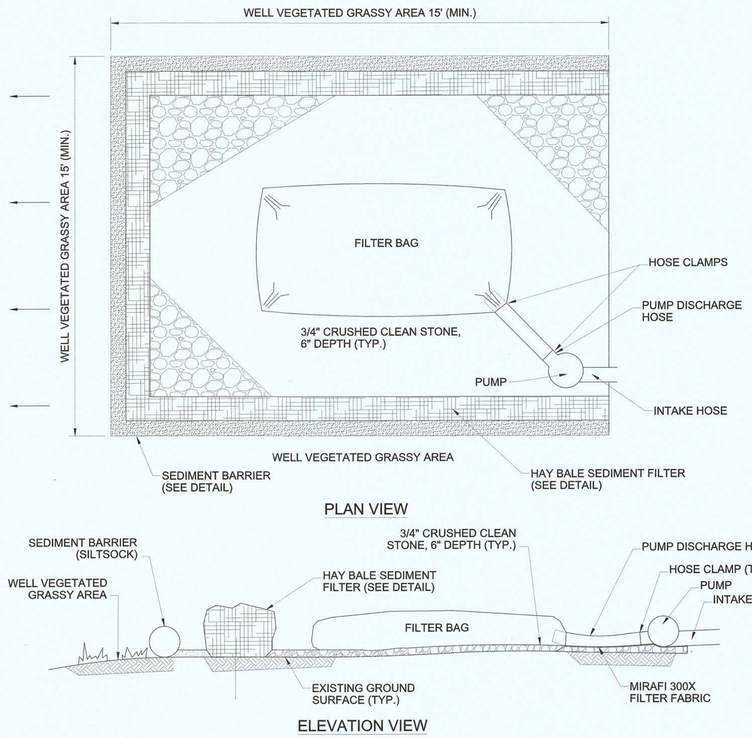
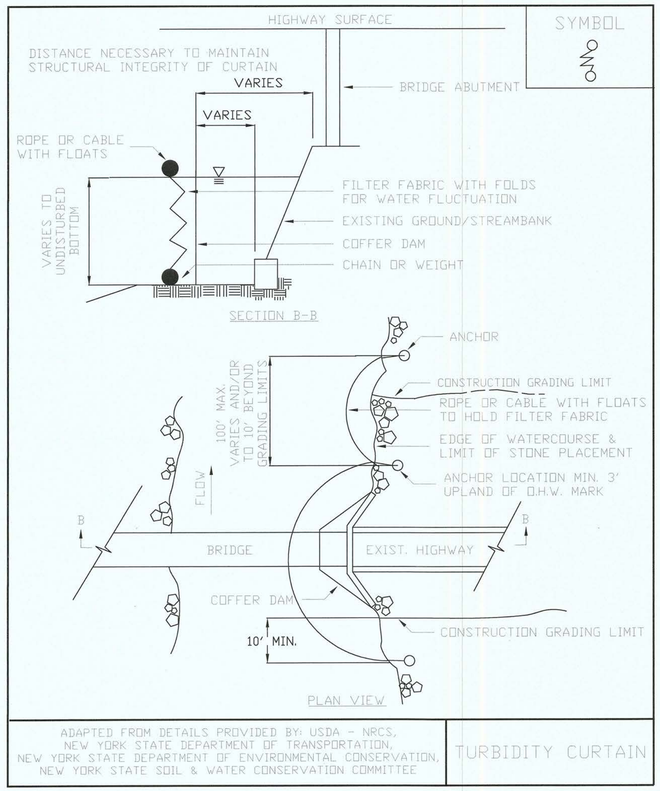


NOTES:

1. SEDIMENT CONTROL BAG MUST BE LOCATED AWAY FROM RECEIVING WATER AND / OR CONSTRUCTION ACTIVITIES.
2. BAG MUST BE DISPOSED OFF ACCORDING TO MANUFACTURER'S INSTRUCTIONS, BAGS MAY NOT BE REUSED.
3. DISCHARGE FROM SEDIMENT CONTROL BAG / DEWATERING FILTER SHALL BE MAINTAINED AS SHEET FLOW IN AN UPLAND AREA WITHIN THE LOD.

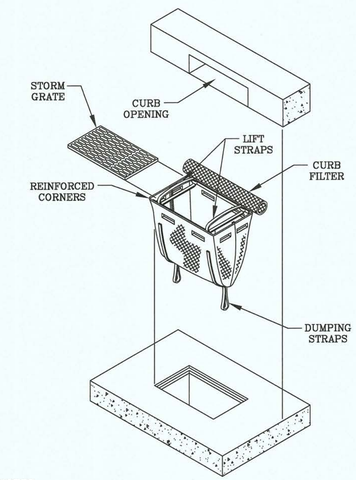
1 SEDIMENT CONTROL BAG - ITEM 24

N.T.S.



2 NYSDEC TURBIDITY CURTAIN - ITEM 24

N.T.S.



NOTES:

1. INLET PROTECTION SHALL BE DANDY CURB SACK OR APPROVED EQUAL DESIGNED TO PROTECT INLET AND CURB INLETS FROM EROSION AND SEDIMENTATION.

3 INLET PROTECTION DETAIL - ITEM 24

N.T.S.

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MARK	DATE	DESCRIPTION	BY
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CITY OF LONG BEACH

NORTH SHORE BULKHEAD PROJECT

CIVIL DETAILS

PROJ:	200-01298-16007
DESN:	JDA
DRWN:	AMB
CHKD:	JO

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STRUCTURAL GENERAL NOTES

A. THESE GENERAL NOTES PRESENT AND/OR SUMMARIZE KEY PROJECT INFORMATION FOR THE DRAWING READER'S CONVENIENCE. SEE ALSO INDIVIDUAL DRAWING NOTES AND PROJECT SPECIFICATIONS FOR FURTHER DETAILS AND REQUIREMENTS.

B. ALL REFERENCES TO REFERENCE STANDARDS HEREIN ARE TO MOST RECENT ISSUE IN EFFECT AS OF THE DATE OF THESE DOCUMENTS, UNLESS NOTED OTHERWISE IN PROJECT SPECIFICATIONS OR ON THE DRAWING

C. ALL EXISTING DIMENSIONS SHOWN WITH THE ± SYMBOL ARE APPROXIMATE AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR BEFORE FABRICATION AND CONSTRUCTION.

D. SUBMIT SHOP DRAWINGS, PROJECT DATA AND SAMPLES AS SPECIFIED IN PROJECT SPECIFICATIONS.

E. ABBREVIATIONS

AB	ANCHOR BOLT	EA	EACH	MISC	MISCELLANEOUS
ADD'L	ADDITIONAL	EF	EACH FACE	MLLW	MEAN LOWER LOW WATER
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION	EL/ ELEV	ELEVATION	MSL	MEAN SEA LEVEL
ALUM	ALUMINUM	ENGR	ENGINEER	MTL	METAL
APPROX	APPROXIMATE	EQ	EQUAL	N	NEW
ARCH	ARCHITECT(URAL)	EW	EACH WAY	NA	NOT APPLICABLE
BFE	BASE FLOOD ELEVATION	EXIST	EXISTING	NS	NEAR SIDE
BO	BOTTOM OF	EXP	EXPANSION	NTS	NOT TO SCALE
C/C	CENTER TO CENTER	EXTG	EXISTING	OC	ON CENTER
CL	CENTER LINE	FIN	FINISH (ED)	PSF	POUNDS PER SQUARE FOOT
CLG	CEILING	FLG	FLANGE	PSI	POUNDS PER SQUARE INCH
CLR	CLEAR	FRP	FIBER REINFORCED POLYMER	PT	PRESSURE TREATED
CLSM	CONTROLLED LOW STRENGTH MATERIAL	FT	FOOT	QTY	QUANTITY
CONC	CONCRETE	FTG	FOOTING	REF	REFERENCE
CONST	CONSTRUCTION	GA	GAGE, GAUGE	REINF	REINFORCEMENT
CONT	CONTINUOUS	GALV	GALVANIZED	REV	REVISION
COORD	COORDINATE	GR	GRADE	SCHED	SCHEDULE
CTR	CENTER	HK	HOOK	SF	SQUARE FOOT
CVR	COVER	HORIZ	HORIZONTAL	SHT	SHEET
DEMO	DEMOLISH	HR	HAND RAIL	SIM	SIMILAR
DIA	DIAMETER	IN	INCH	SPA	SPACE
DIM	DIMENSION	L	ANGLE	SPEC	SPECIFICATIONS
DIST	DISTANCE	LBS	POUNDS	SQ	SQUARE
DN	DOWN	LF	LINEAR FOOT (FEET)	STL	STEEL
DTL.	DETAIL	MAX	MAXIMUM	STRUCT	STRUCTURE(AL)
DWG(S)	DRAWING(S)	MFR	MANUFACTURER	T/	TOP OF
DWL	DOWEL	MHHW	MEAN HIGHER HIGH WATER	THK	THCKNESS
E	EXISTING	MID	MIDDLE / MIDPOINT	TOC	TOP OF CONCRETE
		MIN	MINIMUM, MINUTE	TYP	TYPICAL
				UNO	UNLESS NOTED OTHERWISE
				VERT	VERTICAL
				VIF	VERIFY IN FIELD
				W/	WITH

DESIGN CRITERIA

A. REFERENCES:

1. ICC INTERNATIONAL BUILDING CODE, 2015 EDITION
2. CODE OF ORDINANCES OF THE CITY OF LONG BEACH
3. ASCE/SEI 7-10 - MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES

B. DEAD LOADS:

DEAD LOAD = (SELF WEIGHT) OR 10 PSF

C. SOIL PARAMETERS: DESIGNS BASED ON A TOTAL SOIL UNIT WEIGHT OF 120 PSF, COHESION OF 0 PSI, AND A FRICTION ANGLE OF 31 DEGREES.

D. SEAWATER PARAMETERS (NAVD 88 ELEVATIONS):

BASE FLOOD ELEVATION (STREET DEAD ENDS)	= 10.0'
BASE FLOOD ELEVATION (W. BAY DRIVE AND CANALS)	= 9.0'
MEAN HIGHER HIGH WATER	= 2.34'
MEAN SEA LEVEL	= -0.12'
MEAN LOWER LOW WATER	= -2.55'

STRUCTURAL CONCRETE

A. REFERENCES:

1. ACI 318 BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
2. ACI SP-66 ACI DETAILING MANUAL
3. CRSI MSP-2-01 MANUAL OF STANDARD PRACTICE
4. CRSI REINFORCING BAR DETAILING
5. CRSI PLACING REINFORCING BARS

B. MATERIALS

1. STRUCTURAL CONCRETE
   a) MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS (f'c).....5000 PSI
   b) ALL CONCRETE EXPOSED TO THE ELEMENTS SHALL BE AIR-ENTRAINED IN ACCORDANCE WITH ASTM C260. SEE SPECIFICATIONS.
   c) ALL CONCRETE AGGREGATE SHALL COMPLY WITH ASTM C33 (NORMAL WEIGHT).

2. REINFORCEMENT
   a) REINFORCING BARS: ASTM A615, GRADE 60, EPOXY COATED

3. ADHESIVE ANCHORS
   a) APPROVED SYSTEMS INCLUDE HILTI RE 500-V3 (ICC ESR 3814) OR HIT-HY 200 HAS WITH SAFESET TECHNOLOGY (ICC ESR 3187) OR EQUAL CONSIDERING LOAD RESISTANCE, IN-SERVICE AND INSTALLATION TEMPERATURE, AVAILABILITY OR COMPREHENSIVE INSTALLATION INSTRUCTIONS, AND CREEP. ADHESIVE ANCHORS SHALL BE APPROVED FOR USE WITH CRACKED CONCRETE PER AC 308. CURRENT ICC-ESR SHALL BE SUBMITTED
   b) ALL PERSONNEL INSTALLING ANCHORS SHALL BE TRAINED BY THE MANUFACTURER ON PROPER INSTALLATION TECHNIQUE. TRAINING DOCUMENTATION FROM THE MANUFACTURER SHALL BE AVAILABLE ON REQUEST.
   c) ADHESIVE ANCHORS SHALL BE PROOF LOADED IN ACCORDANCE WITH ACI 355.4 AS REQUIRED BY SPECIAL INSPECTION.

4. GROUT: HIGH STRENGTH, NON-SHRINK STRUCTURAL GROUT. SEE SPECIFICATIONS.

5. CONTROLLED LOW STRENGTH MATERIAL (CLSM): PROVIDE CLSM WITH A COMPRESSIVE STRENGTH OF 150 PSI. STANDARD TESTING TO COMPLY WITH D4832 REQUIREMENTS.

C. REINFORCEMENT DETAILING

1. ALL REINFORCING STEEL DETAILS SHALL BE IN ACCORDANCE WITH THE ACI CODE REQUIREMENTS (ACI 318 - CURRENT EDITIONS).
2. REINFORCING STEEL PLACING DRAWINGS AND BAR LISTS SHALL CONFORM TO THE ACI OR CRSI DETAILING MANUALS. ALL BAR SUPPORTS MUST BE CLEARLY DETAILED

STRUCTURAL CONCRETE (CONTINUED)

3. CONCRETE COVER FOR REINFORCING SHALL BE INDICATED ON THE APPLICABLE REINFORCING STEEL SHOP DRAWINGS. HOWEVER, NO REINFORCING IN AREAS EXPOSED TO EARTH, WEATHER OR WATER SHALL HAVE COVER LESS THAN THREE INCHES.
4. SPECIFIED COVER FOR REINFORCING PER ACI 318 (BUILDING STRUCTURES):
   BEAMS.....3"
5. HOOKS AND BENDS SHALL MEET ACI STANDARD UNLESS OTHERWISE INDICATED.
6. SPLICES: CONTINUOUS REINFORCING BARS SHALL BE FURNISHED WITH CLASS 'B' TENSION LAPS SPLICES INCLUDING CORNER BARS, UNLESS NOTED OTHERWISE.
7. MECHANICAL SPLICES SHALL NOT BE PERMITTED UNLESS SHOWN ON THE DRAWINGS OR APPROVED BY THE ENGINEER
8. REINFORCING STEEL FABRICATION AND PLACEMENT SHALL BE IN ACCORDANCE WITH CRSI MANUAL OF STANDARD PRACTICE AND CRSI PLACING REINFORCING BARS (LATEST EDITIONS).
9. ALL REINFORCING SHALL BE HELD SECURELY IN POSITION WITH STANDARD ACCESSORIES IN CONCRETE
10. NO REINFORCING STEEL SHALL BE FIELD BENT WITHOUT THE APPROVAL OF THE STRUCTURAL ENGINEER. FIELD BENDING OF PLAIN REINFORCEMENT, IF PERMITTED, SHALL BE PERFORMED USING AN APPROVED AND APPROPRIATE SIZED PORTABLE HYDRAULIC DEVICE THAT MAKES ACI STANDARD RADIUS BENDS. NO OTHER FIELD BENDING METHOD SHALL BE PERMITTED.
11. WELDING, INCLUDING TACK WELDING, FOR REINFORCING STEEL IS PROHIBITED. WELDING OF REINFORCING STEEL AND HIGH STRENGTH BOLTS, IE. A36, F1554, WILL BE PERMITTED ONLY BY WRITTEN APPROVAL OF THE ENGINEER.
12. ALL OPENINGS THROUGH CONCRETE NOT DETAILED ON THE STRUCTURAL DRAWINGS MUST BE LOCATED BY THE CONTRACTOR AND SHOWN ON THE APPLICABLE REINFORCING STEEL SHOP DRAWINGS. THE FINAL LOCATION OF ALL OPENINGS MUST BE REVIEWED BY THE ENGINEER BEFORE THE CONCRETE IS POURED.

D. FORMWORK

1. SEE SPECIFICATIONS
2. CAMBER: PROVIDE CAMBER TO COMPENSATE FOR DISPLACEMENT OF FORMS (SEE ALSO SPECS.) AND TO PROVIDE AS-CAST MEMBER CAMBER AS NOTED ON DRAWINGS.
3. RUSTICATION STRIPS, CHAMFERS, DRIPS, MISC. EMBEDS, ETC. SEE DRAWINGS AND/OR ARCHITECTURAL DRAWINGS.
4. PROVIDE 3/4" CHAMFER AT ALL EXPOSED CORNERS OF BEAMS ETC. UNLESS OTHERWISE NOTED.
5. OPENINGS FOR MEP TRADES ARE TO BE INCLUDED IN THE BID. ALL HOLES FOR OTHER TRADES WHICH MUST BE CUT OR FORMED AND WHICH ARE NOT SHOWN ON THE STRUCTURAL DESIGN(S) DRAWINGS SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER DESIGNER FOR REVIEW AND APPROVAL. ANY STRENGTHENING OR ADDITIONAL REINFORCEMENT REQUIRED SHALL BE FURNISHED BY THE CONTRACTOR WITHOUT ADDITIONAL COST TO THE OWNER.
6. FOR CONTROLLED LOW STRENGTH MATERIAL (CLSM) INSTALLATION, PLACE CLSM ON TWO, EQUAL DEPTH POURS AND ALLOW FIRST POUR TO CURE TO DESIGN STRENGTH PRIOR TO PLACEMENT OF SECOND POUR.
   A. 28-DAY COMPRESSIVE STRENGTH TO BE 150 PSI
   B. IN-PLACE DENSITY TO BE 145 PCF

E. CONCRETE FINISHES: SEE SPECIFICATIONS

1. FORMED SURFACES:
   a) EXPOSED TO VIEW: SMOOTH FORMED FINISH.
   b) COVERED OR AS NOTED ON PLANS: AS-CAST

2. FLATWORK:
   a) EXPOSED TO VIEW: TROWELED

F. CURING AND PROTECTION: SEE SPECIFICATIONS.

G. SUBMITTALS

1. CONTRACTOR SHALL BE RESPONSIBLE FOR SUBMITTING THE FOLLOWING DOCUMENTS TO THE ENGINEER OF RECORD:
   a) CONCRETE MIX DESIGN
   b) CONCRETE REINFORCING DRAWINGS

STRUCTURAL TIMBER

A. SAWN LUMBER:

1. ALL MEMBERS SHALL HAVE THE MINIMUM STRENGTH REQUIREMENTS EQUIVALENT TO SOUTHERN PINE, NO. 2 GRADE AS LISTED IN "NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION" (NDS), WITH A MAXIMUM MOISTURE CONTENT OF 19%. "STUD" GRADE MATERIAL IS STRICTLY PROHIBITED FROM USE.
2. ALL MEMBERS SHALL BE PRESSURE TREATED IN ACCORDANCE WITH THE MANUAL OF RECOMMENDED PRACTICE OF THE AMERICAN WOOD PRESERVERS' ASSOCIATION STANDARDS (AWPA).
3. ALL METAL FRAMING ANCHORS AND POST-INSTALLED CONCRETE ADHESIVE ANCHORS SHALL BE INSTALLED PER THE MANUFACTURER'S WRITTEN RECOMMENDATIONS.
4. SUBSTITUTIONS MAY BE CONSIDERED FOR THE METAL FRAMING ANCHORS, SUBMIT SUBSTITUTION REQUEST WITH PUBLISHED DESIGN LOADS AND METHODS FOR ATTACHMENT. SUBSTITUTION REQUESTS MUST BE SUBMITTED TO THE ENGINEER OF RECORD PRIOR TO THE START OF CONSTRUCTION.
5. CUTTING OR NOTCHING IS NOT ALLOWED WITHOUT WRITTEN APPROVAL FROM THE ENGINEER.

B. MECHANICAL FASTENERS:

1. STAINLESS STEEL TYPE 316 STRUCTURAL BOLTS SHALL CONFORM TO ANSI/ASME STANDARD B18.2.1-1981. HOLES SHALL BE DRILLED NOT MORE THAN 1/16" LARGER THAN BOLT DIAMETER.

C.

1. SUBMIT SHOP DRAWINGS FOR REVIEW AND APPROVAL PRIOR TO FABRICATION OR CONSTRUCTION. SHOP DRAWINGS SHALL INCLUDE AN ERECTION PLAN AND FABRICATION DETAILS.

STRUCTURAL STEEL

A. REFERENCES:

1. AISC STEEL CONSTRUCTION MANUAL, 14TH EDITION
2. AWS D1.1 STRUCTURAL WELDING CODE - STEEL

B. MATERIALS:

1. GRADE STEEL
   WIDE FLANGES.....ASTM A992, GRADE 50
   CHANNELS, ANGLES, AND PLATES.....ASTM A36

2. STRUCTURAL BOLTS: ASTM A325-N
3. WELDS: E70XX ELECTRODES

STRUCTURAL STEEL (CONTINUED)

C. CONNECTIONS

1. AISC MANUAL STANDARD CONNECTIONS UNLESS NOTED. HIGH-STRENGTH BOLTS: ASTM A325-N, 3/4" UNLESS NOTED OTHERWISE. BEARING TYPE INSTALLED IN CONFORMANCE WITH "SPECIFICATIONS FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS", RESEARCH COUNCIL ON RIVETED AND BOLTED STRUCTURAL JOINTS. UNLESS NOTED OTHERWISE, STANDARD AISC "USUAL GAGE" DIMENSIONS SHALL BE USED FOR LOCATING HOLES FOR BOLTS, EXPANSION ANCHORS, ETC. IN ALL ANGLES, BEAM FLANGES, ETC.
2. THE ASSEMBLY SURFACE, INCLUDING THOSE ADJACENT TO THE WASHER, SHALL BE FREE OF MILL SCALE, OIL, PAINT OR OTHER COATINGS.
3. ALL HIGH STRENGTH BOLTS SHALL BE TIGHTENED TO A BOLT TENSION NOT LESS THAN THAT SPECIFICATION IN THE AISC MANUAL. FULL TENSIONING SHALL BE BY THE TURN OF NUT METHOD, BY A DIRECT TENSION INDICATOR, OR BY PROPERLY CALIBRATED WRENCHES. PROVIDE HARDENED WASHERS UNDER THE NUT OR BOLT HEAD, WHICHEVER IS THE ELEMENT TURNED IN TIGHTENING.
4. WELDING - PERFORM ALL WELDING IN ACCORDANCE WITH AWS D1.1 CODE, LATEST EDITION, WELDS SHALL BE MADE ONLY BY OPERATORS CERTIFIED BY AWS IN PERFORMING THE TYPE OF WORK INDICATED.

D. TOLERANCES: AISC CODE OF STANDARD PRACTICE (LATEST EDITION)

E. CAMBER: PROVIDE POSITIVE CAMBER AS NOTED ON DRAWINGS. WHERE NO CAMBER IS NOTED, RESIDUAL MILL CAMBER IS TO BE UPWARDS.

F. SHOP DRAWINGS

1. SUBMIT ERECTION AND FABRICATION SHOP DRAWINGS. SEE SPECS.

G. ALL STEEL AND ACCESSORIES SHALL BE HOT DIPPED GALVANIZED (G90).

ASSUMED SEQUENCE AND INSTALLATION PLAN

THE FOLLOWING ARE THE ASSUMED SEQUENCE OF INSTALLATION PROCEDURES ASSOCIATED WITH THE WORK REQUIRED AT THE NORTH SHORE SEAWALL. CONTRACTOR TO BE RESPONSIBLE FOR ALL FINAL INSTALLATION PROCEDURES, AS REQUIRED AND/OR MODIFIED FOR ACTUAL VERIFIED FIELD CONDITIONS.

THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE STABILITY OF THE EXISTING BULKHEADS AND OTHER WALLS THROUGH CONSTRUCTION, INCLUDING DEMOLITION, THE INSTALLATION OF THE NEW BULKHEADS, ANCHOR INSTALLATION, AND CLSM PLACEMENT.

AT LEAST 30 DAYS PRIOR TO MOBILIZATION TO THE SITE, THE CONTRACTOR SHALL PREPARE AND SUBMIT A BULKHEAD INSTALLATION PLAN FOR REVIEW. AT A MINIMUM, THIS PLAN SHALL INCLUDE THE FOLLOWING: EQUIPMENT TO BE USED, PROPOSED MATERIALS, PROPOSED STABILIZATION SYSTEM, DEMOLITION PROCEDURES, INSTALLATION SEQUENCE FOR CANTILEVER WALLS, INSTALLATION SEQUENCE FOR ANCHORED WALLS INCLUDING ANCHOR STRESSING, AND THE PLACEMENT OF CLSM IN BETWEEN THE EXISTING BULKHEAD AND THE NEW BULKHEAD. THE PLAN SHALL INCORPORATE AND INCLUDE RECOMMENDATIONS FROM THE SHEET PILE MANUFACTURER. BY SUBMITTING THIS PLAN, THE CONTRACTOR AFFIRMS HE HAS VISITED THE SITE, OBSERVED AND NOTED THE EXISTING CONDITIONS, VERIFIED THE EXISTING DIMENSIONS, AND HAS PROVIDED A STABILIZATION SYSTEM AND INSTALLATION SEQUENCE THAT WILL NOT RESULT IN DEFLECTIONS GREATER THAN 2% OF THE BULKHEAD HEIGHT NOR OVERSTRESS THE ANCHORAGE SYSTEM.

1. CONTRACTOR TO VERIFY ALL FIELD CONDITIONS AND EXISTING DIMENSIONS AND NOTIFY ENGINEER IMMEDIATELY IF DISCREPANCIES EXIST BETWEEN IDENTIFIED SCOPE OF WORK AND ACTUAL FIELD CONDITIONS.
2. AT LOCATIONS OF NEW HELICAL ANCHORS, SAWCUT HOLE IN EXISTING BULKHEAD AS REQUIRED FOR NEW ANCHOR INSTALLATION.
3. INSTALL NEW HELICAL ANCHORS TO REQUIRED DEPTH AND TORQUE.
4. PREPARE, CLEAN AND COAT EXISTING BULKHEAD AS NOTED IN CONTRACT DOCUMENTS.
5. PRIOR TO DEMOLITION AND REMOVAL OF EXISTING TIMBER PILES, CONTRACTOR TO SHORE TOP OF EXISTING BULKHEAD FROM LANDSIDE WITH TEMPORARY DEADMAN AND ASSOCIATED TEMPORARY SHORING OR OTHER STABILIZATION SYSTEM.
6. AT LOCATIONS OF EXISTING WALERS TO REMAIN, CLOSE ENDS OF EXISTING WALERS FOR CONTROLLED LOW STRENGTH MATERIAL PLACEMENT WITH NEW TIMBER MEMBERS AS SHOWN IN DETAIL 7/S-102.
7. ONCE TOP OF EXISTING BULKHEAD IS ADEQUATELY SUPPORTED, CONTRACTOR TO BEGIN INSTALLATION OF NEW FRP SHEET PILE BULKHEAD BY STARTING AT ONE END OF PROPOSED NEW BULKHEAD RUN AND WORKING TOWARDS OTHER END. AS WORK PROGRESSES, CONTRACTOR TO REMOVE EXISTING TIMBER PILES AS NECESSARY FOR NEW FRP SHEET PILE INSTALLATION, AND AS PERMITTED BY TEMPORARY DEADMAN AND SHORING SYSTEM. DO NOT REMOVE EXISTING TIMBER PILES WITHOUT ADEQUATE SUPPORT OF EXISTING BULKHEAD AND WALERS FROM NEW FRP BULKHEAD SYSTEM OR BY TEMPORARY DEADMAN AND SHORING OR OTHER STABILIZATION SYSTEM.
8. INSTALL NEW WALERS AT LOCATIONS INDICATED IN CONTRACT DOCUMENTS.
9. AT LOCATIONS OF EXISTING PIPING TO REMAIN. REINFORCE OPENING AROUND BULKHEAD PENETRATION AS SHOWN IN DETAILS ON SHEET S-501. SEE CIVIL DRAWINGS FOR ADDITIONAL INFORMATION.
10. PREP FOR CONTROLLED LOW STRENGTH MATERIAL (CLSM) PLACEMENT BY INSTALLING END CONDITIONS AS DETAILS ON SHEET S-102. CONTRACTOR TO PROVIDE ACCESS HOLES THROUGH EXISTING WALERS FOR PROPER CLSM INSTALLATION. CONTRACTOR TO ENSURE NO VOIDS EXIST WITHIN CLSM PLACEMENT AREA. CONTRACTOR TO COORDINATE LOCATION OF ACCESS HOLES WITH HELICAL ANCHOR AND WEEP HOLE SYSTEM LOCATIONS.
11. INSTALL FIRST LAYER OF CLSM AND ALLOW TO PROPERLY CURE.
12. SAWCUT REQUIRED OPENINGS IN NEW FRP SHEET PILE SYSTEM FOR INSTALLATION OF HELICAL ANCHOR EXTENSION.
13. INSTALL HELICAL ANCHOR EXTENSIONS THROUGH NEW FRP SHEET PILES, INSTALL WALERS AND TIGHTEN ANCHORS TO REQUIRED TORQUE. CARE SHALL BE TAKEN AS NOT TO OVERTIGHTEN ANCHORS.
14. INSTALL WEEP HOLE SYSTEM IN FACE OF NEW FRP BULKHEAD SYSTEM, AND THROUGH EXISTING BULKHEAD AS INDICATED IN DRAWINGS. CONTRACTOR TO COORDINATE LOCATIONS OF WEEPHOLES WITH LOCATIONS OF NEW HELICAL ANCHORS AND WALERS, IF APPLICABLE. NEW WEEP HOLE SYSTEM TO BE AT LEAST 2'-0" AWAY FROM NEW HELICAL ANCHORS.
15. WHERE INDICATED IN CONTRACT DOCUMENTS, CONTRACTOR TO SAWCUT AND REMOVE TOP OF EXISTING BULKHEAD STRUCTURE AS REQUIRED TO ENSURE 4-INCHES OF COVER OVER TOP OF THE EXISTING BULKHEAD TO REMAIN AFTER FINISH GRADING WORK. CONTRACTOR TO COORDINATE WITH TEMPORARY DEADMAN AND SHORING OR OTHER STABILIZATION SYSTEM.
16. INSTALL CLSM IN TWO, EQUAL POURS, BETWEEN EXISTING AND NEW BULKHEADS AS INDICATED IN CONTRACT DOCUMENTS.
17. ONCE ALL INSTALLED CLSM HAS REACHED THE SPECIFIED DESIGN COMPRESSIVE STRENGTH, CONTRACTOR TO REMOVE ALL TEMPORARY DEADMAN AND SHORING SYSTEMS.
18. INSTALL PILE CAP AS INDICATED ON CONTRACT DOCUMENTS.

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MARK	DATE	DESCRIPTION	BY
	08/08/19	100% BID DOCUMENTS	ATC

CITY OF LONG BEACH

NORTH SHORE BULKHEAD PROJECT

STRUCTURAL GENERAL NOTES

Project No.:	200-01298-16007
Designed By:	PN
Drawn By:	JKS
Checked By:	ATC

S-001

Copyright: Tetra Tech

Bar Measures 1 inch

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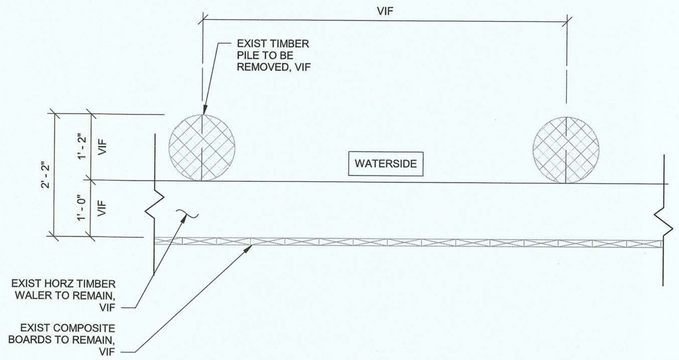
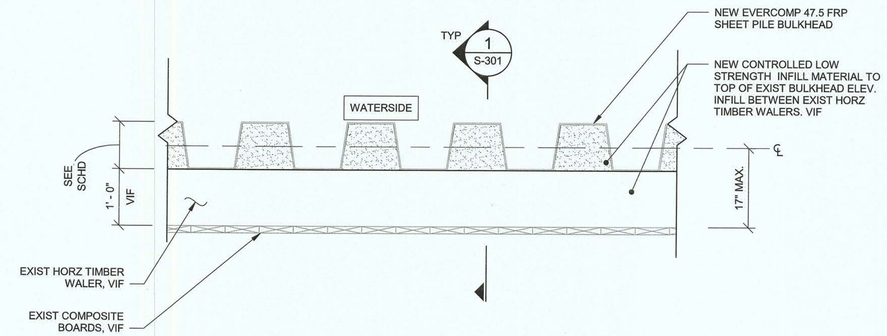
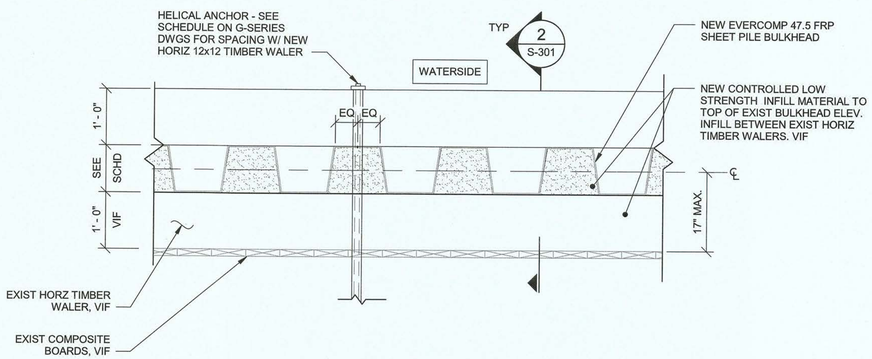


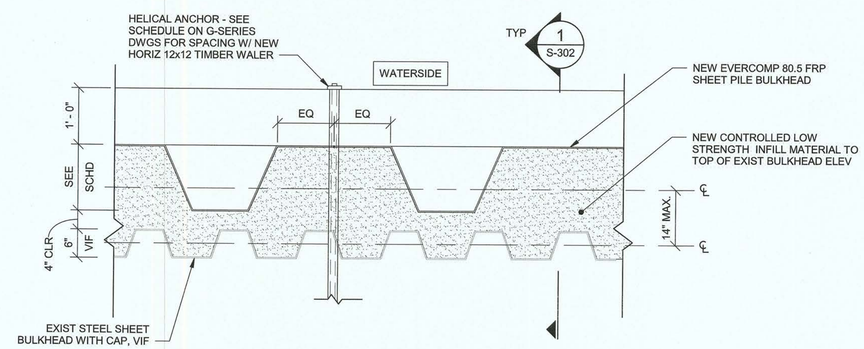
1 / S-101 DEMO PLAN FOR TYPE 1 & 2 - ITEM 1
SCALE: 3/4" = 1'-0"



2 / S-101 TYPE 1- NEW FRP SHEET PILE AT EXIST COMPOSITE BOARD - ITEM 2
SCALE: 3/4" = 1'-0"



3 / S-101 TYPE 2 - NEW FRP SHEET PILE W/ WALER AND ANCHORS- ITEM 3
SCALE: 3/4" = 1'-0"



4 / S-101 TYPE 3 - NEW FRP SHEET PILE W/ WALER AND ANCHORS - ITEM 4
SCALE: 3/4" = 1'-0"

0 8" 1'-4" 2'-8"
SCALE: 3/4" = 1'-0"

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MARK	DATE	DESCRIPTION	BY
	08/08/19	100% BID DOCUMENTS	ATC

CITY OF LONG BEACH
NORTH SHORE BULKHEAD PROJECT
STRUCTURAL BULKHEAD PLANS

Project No.:	200-01298-16007
Designed By:	PN
Drawn By:	JKS
Checked By:	ATC

S-101

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Bar Measures 1 inch

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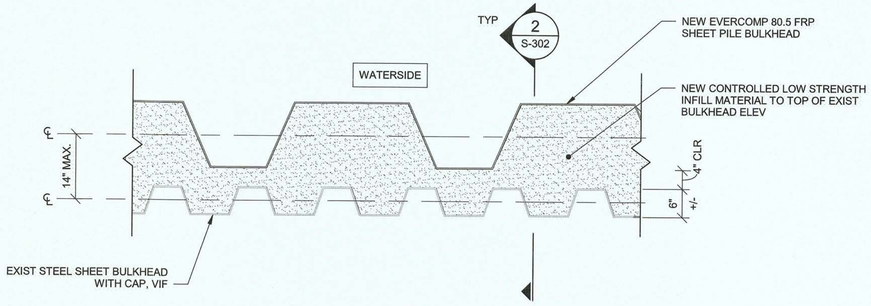
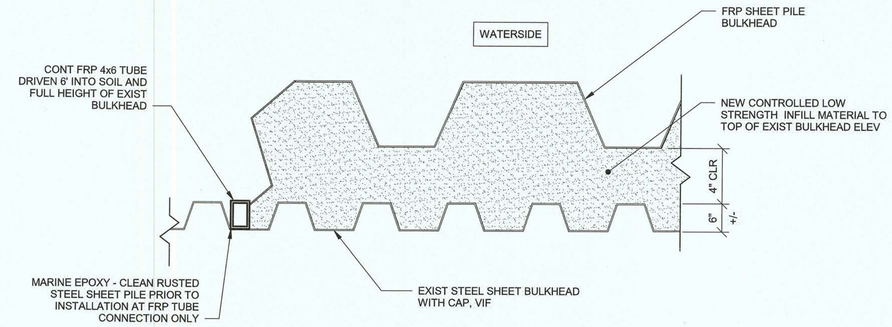


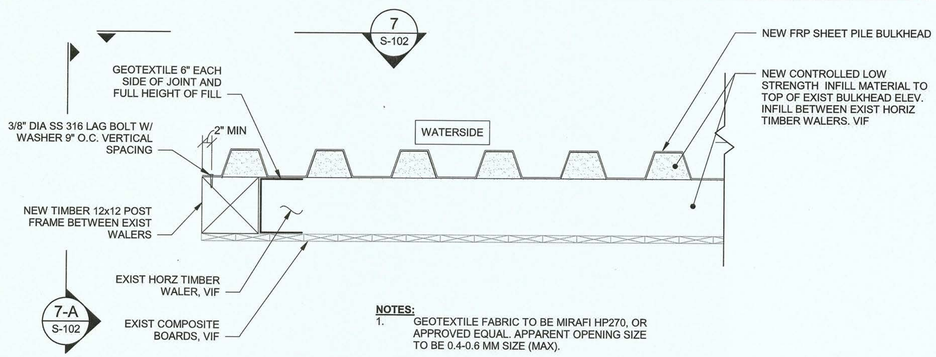
1 S-102 TYPE 4- NEW FRP SHEET PILE INFRONT OF THE EXIST STEEL SHEET PILE - ITEM 5

SCALE: 3/4" = 1'-0"



2 S-102 FRP SHEET PILE END CONDITION

SCALE: 3/4" = 1'-0"

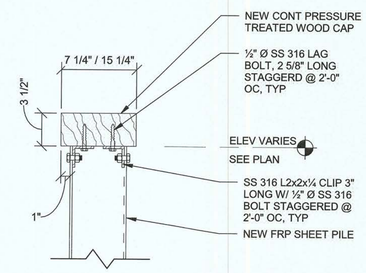


NOTES:

1. GEOTEXTILE FABRIC TO BE MIRAFI HP270, OR APPROVED EQUAL. APPARENT OPENING SIZE TO BE 0.4-0.6 MM SIZE (MAX).

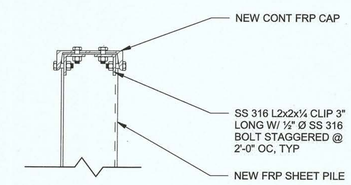
3 S-102 NEW FRP SHEET PILE END CONDITION

SCALE: 3/4" = 1'-0"



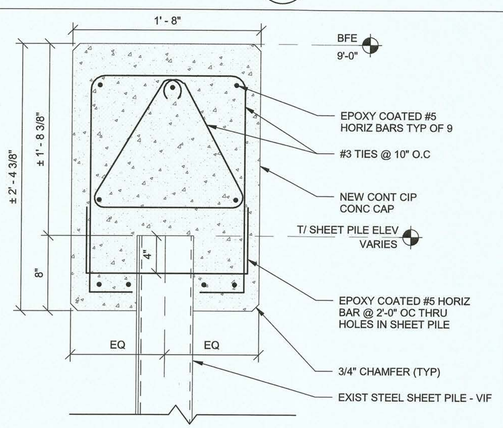
4 S-102 TIMBER PILE CAP - ITEM 6

SCALE: 1 1/2" = 1'-0"



5 S-102 FRP PILE CAP - ITEM ALT-1

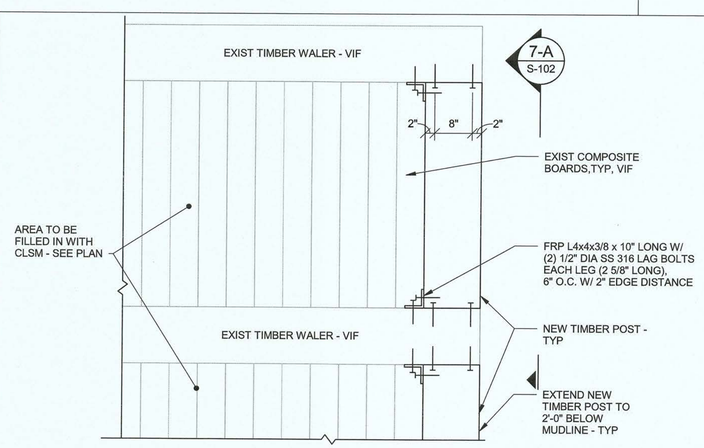
SCALE: 1 1/2" = 1'-0"



6 S-102 NEW CONCRETE CAP - ITEM 7

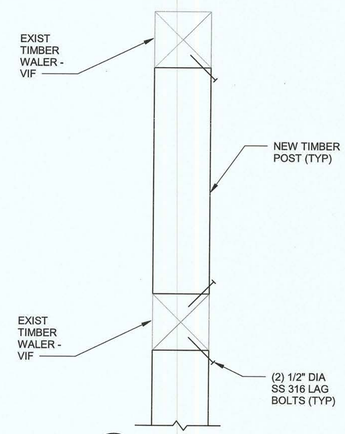
SCALE: 1 1/2" = 1'-0"

NOTES:
1. SEE NOTES ON S-001 FOR COVER AND REBAR BEND REQUIREMENTS.



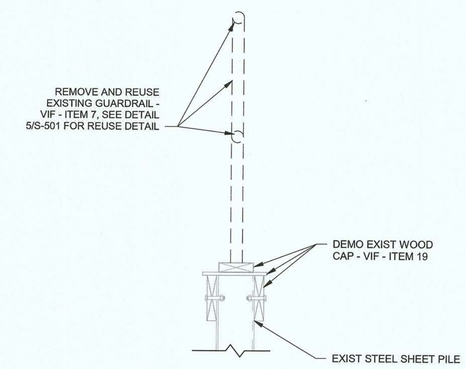
7 S-102 NEW POST TO WALER CONN

SCALE: 3/4" = 1'-0"



7-A S-102 SECTION

SCALE: 3/4" = 1'-0"



8 S-102 WOOD CAP DEMO SECTION

SCALE: 1" = 1'-0"

0 1/2' 1' 2'
SCALE: 1" = 1'-0"

0 4" 8" 1'-4"
SCALE: 1 1/2" = 1'-0"

0 8" 1'-4" 2'-8"
SCALE: 3/4" = 1'-0"

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CITY OF LONG BEACH

NORTH SHORE BULKHEAD PROJECT

STRUCTURAL BULKHEAD PLANS

Project No.:	200-01298-16007
Designed By:	PN
Drawn By:	JKS
Checked By:	ATC

S-102

Bar Measures 1 inch

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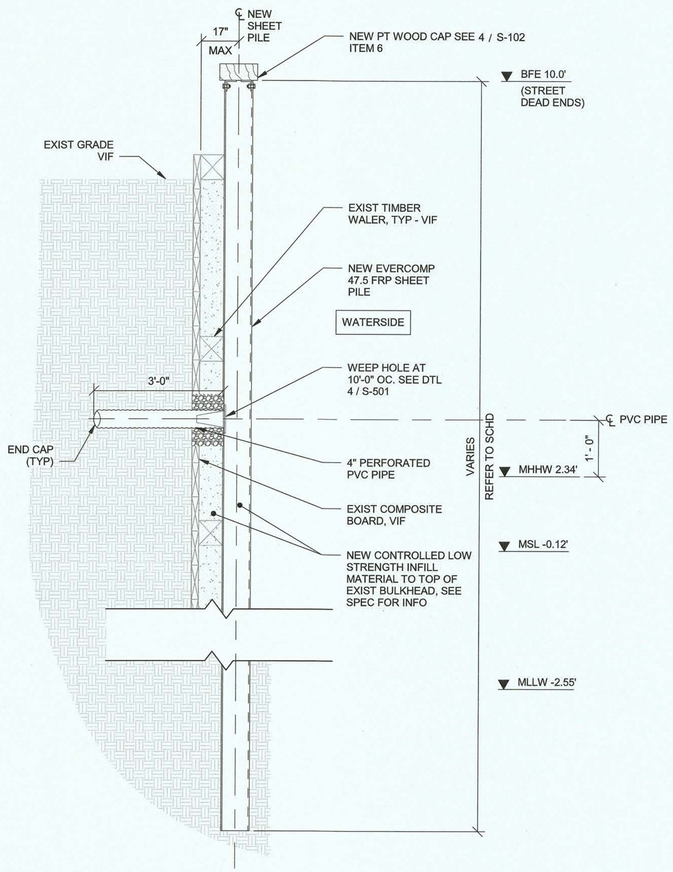
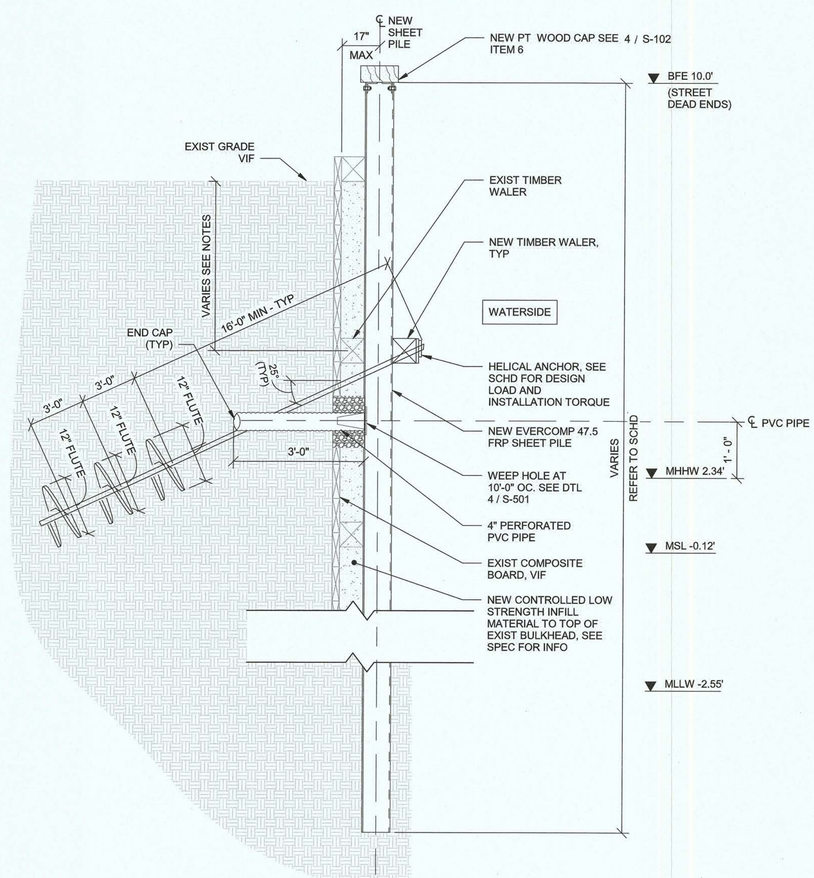


1 S-301 TYPE 1 SECTION - ITEM 2

SCALE: 3/4" = 1'-0"

NOTE:
1. SEE SHEET S-001 FOR ASSUMED SEQUENCE AND INSTALLATION PLAN FOR BULKHEAD CONSTRUCTION



2 S-301 TYPE 2 SECTION - ITEM 3

SCALE: 3/4" = 1'-0"

NOTES:

1.VERTICAL DISTANCE FROM LANDSIDE GRADE TO ANCHOR VARIES WITH WALL HEIGHT AS SHOWN BELOW:

WALL HEIGHT	DISTANCE
8 FT	2.5 FT
10 FT	3 FT
12.5FT	3.5FT

2.SEE SHEET S-001 FOR ASSUMED SEQUENCE AND INSTALLATION PLAN FOR BULKHEAD CONSTRUCTION

0 8" 1'-4" 2'-8"

SCALE: 3/4" = 1'-0"

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MARK	DATE	DESCRIPTION	BY
	08/08/19	100% BID DOCUMENTS	ATC

CITY OF LONG BEACH

NORTH SHORE BULKHEAD PROJECT

STRUCTURAL BULKHEAD SECTIONS

Project No.:	200-01298-16007
Designed By:	PN
Drawn By:	JKS
Checked By:	ATC

S-301

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Bar Measures 1 inch

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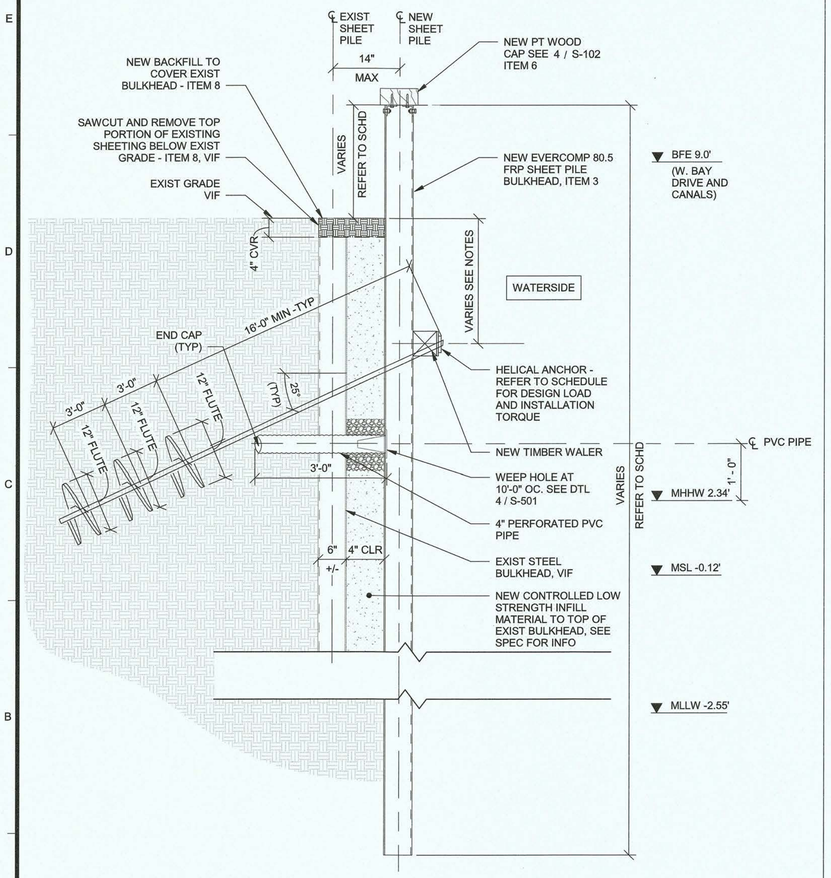


1 / S-302 TYPE 3 SECTION - ITEM 4

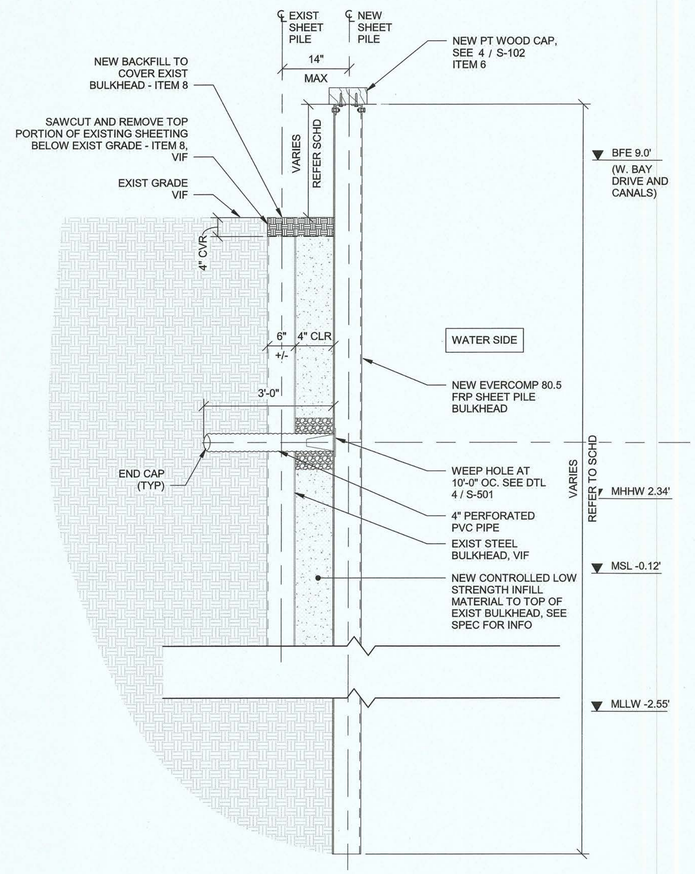
SCALE: 3/4" = 1'-0"

NOTES:

1.VERTICAL DISTANCE FROM LANDSIDE GRADE TO ANCHOR VARIES WITH WALL HEIGHT AS SHOWN BELOW:

WALL HEIGHT	DISTANCE
8 FT	2.5 FT
10 FT	3 FT
12.5FT	3.5FT

2.SEE SHEET S-001 FOR ASSUMED SEQUENCE AND INSTALLATION PLAN FOR BULKHEAD CONSTRUCTION



2 / S-302 TYPE 4 SECTION - ITEM 5

SCALE: 3/4" = 1'-0"

NOTE:
1. SEE SHEET S-001 FOR ASSUMED SEQUENCE AND INSTALLATION PLAN FOR BULKHEAD CONSTRUCTION

0 8" 1'-4" 2'-8"
SCALE: 3/4" = 1'-0"

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CITY OF LONG BEACH

NORTH SHORE BULKHEAD PROJECT

STRUCTURAL BULKHEAD SECTIONS

Project No.:	200-01298-16007
Designed By:	PN
Drawn By:	JKS
Checked By:	ATC

S-302

Copyright: Tetra Tech

Bar Measures 1 inch

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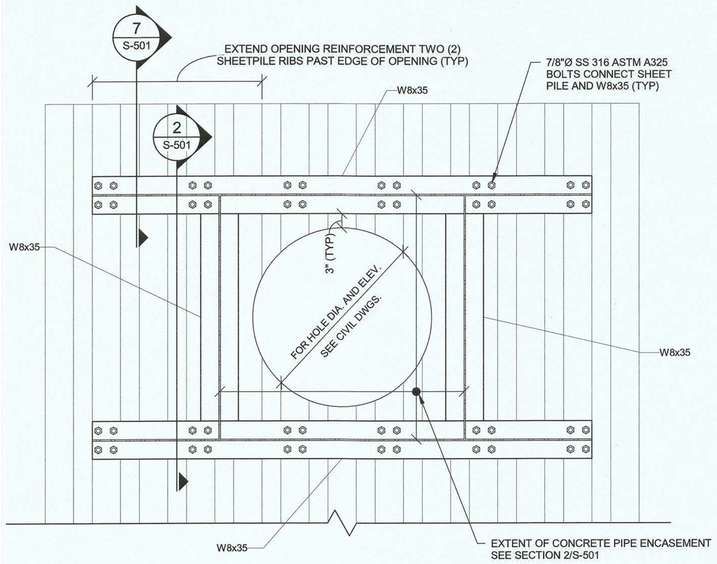
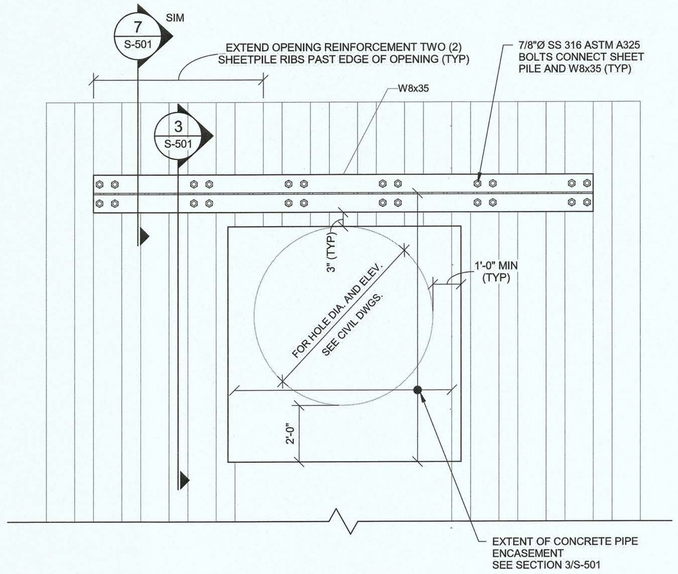


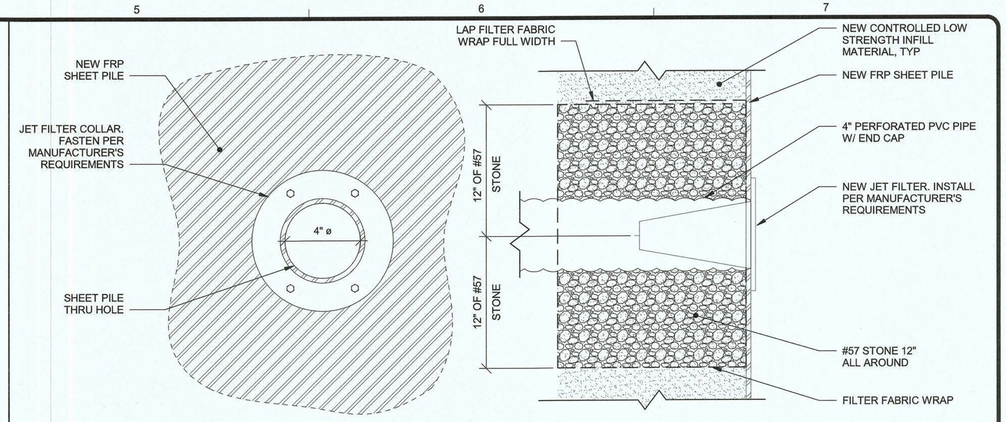
NEW PIPE



EXISTING PIPE

1 S-501 TYPICAL INBOARD ELEVATION AT BULKHEAD PIPE OPENINGS

SCALE: 3/4" = 1'-0"

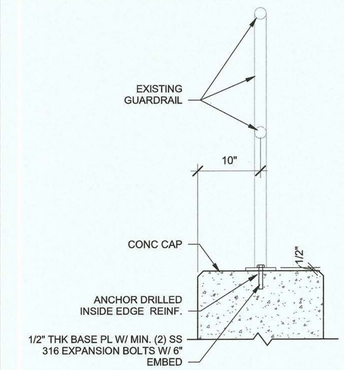


4 S-501 WEEPHOLE DETAIL

SCALE: 3" = 1'-0"

NOTE:

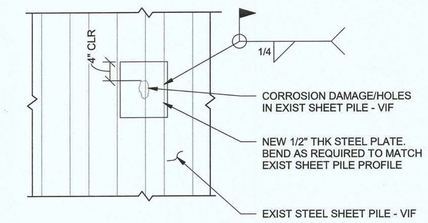
1. DESIGN INTENT IS FOR ALL WEEPHOLES TO BE INSTALLED FROM THE WATERSIDE OF BULKHEAD



AT CONC. CAP

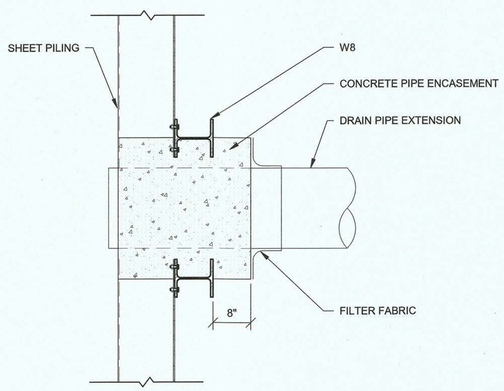
5 S-501 HANDRAIL SECTION AND MOUNTING - ITEM 7

SCALE: 1" = 1'-0"



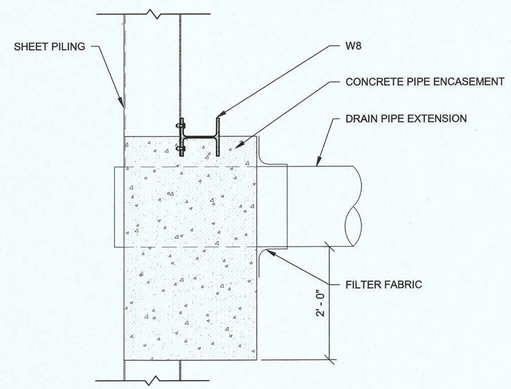
6 S-501 EXISTING SHEET PILE HOLE/ REPAIR DETAIL - ITEM 20

SCALE: 3/4" = 1'-0"



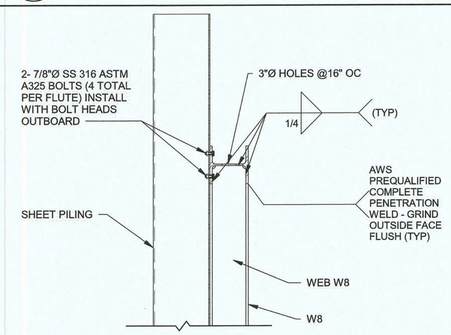
2 S-501 NEW PIPE EXTENSION - SHEET PILE INTERFACE DETAIL

SCALE: 3/4" = 1'-0"



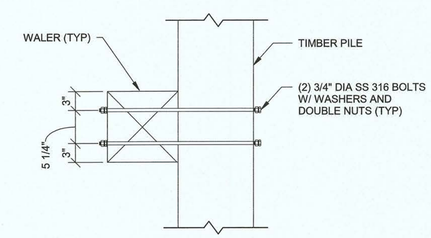
3 S-501 EXIST PIPE EXTENSION - SHEET PILE INTERFACE DETAIL

SCALE: 3/4" = 1'-0"



7 S-501 SECTION

SCALE: 3/4" = 1'-0"



8 S-501 PILE TO WALER CONN

SCALE: 1" = 1'-0"

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CITY OF LONG BEACH

NORTH SHORE BULKHEAD PROJECT

STRUCTURAL TYPICAL DETAILS

Project No.:	200-01298-16007
Designed By:	PN
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S-501

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Bar Measures 1 inch

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