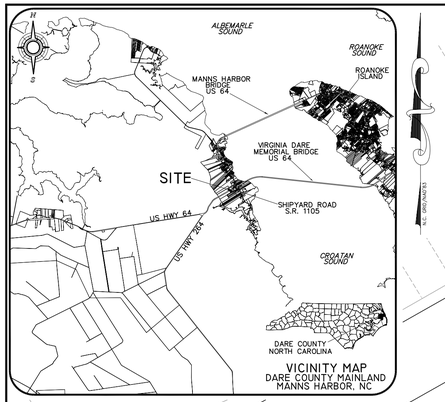

VICINITY MAP
DARE COUNTY MAINLAND
MANNS HARBOR, NC

U.S. HIGHWAY 64/264

PARCEL 1
AREA = 81,243 SQ.FT.
ZONING - MHB

7 TYPICAL SINGLE FAMILY RESIDENCES
2 STORY FRAME ON PILINGS
WITH PARTIAL GROUND LEVEL ENCLOSURE
MAXIMUM HEATED AREA = 1,200 SQ.FT.

5 TYPICAL SINGLE FAMILY RESIDENCES
2 STORY FRAME ON PILINGS
WITH PARTIAL GROUND LEVEL ENCLOSURE
MAXIMUM HEATED AREA = 1,200 SQ.FT.

20' ASPHALT ROADWAY
30' R/W

STORMWATER SWALES

SYSTEM A - Q= 2,520 GPD
L.P.P. DISPOSAL BED

EZ-TREAT MODEL 3,000 GPD
WASTEWATER TREATMENT SYSTEM

BOAT/TRAILER/RV PARKING

PARCEL 2
AREA = 55,909 SQ.FT.
ZONING - MHB

STORMWATER SWALES

PARCEL 3
AREA = 3,708 SQ.FT.
ZONING - MHB

4' BOARDWALK

SHIPYARD ROAD S.R. 1105

ZONING - MHA

RESIDENTIAL PUMP SYSTEM

STORMWATER SWALES

NOT A PART

PLAYGROUND

SYSTEM B - Q= 1,800 GPD
L.P.P. DISPOSAL BED

EZ-TREAT MODEL 3,000 GPD
WASTEWATER TREATMENT SYSTEM

ZONING - MHB

CANAL

BOAT RAMP

PARCEL 4
AREA = 713,684 SQ.FT.
ZONING - MHB

CANAL

ZONING - MHA

ZONING - MHB

ACOE WETLANDS

NOTES AND DEVELOPMENT DATA:

1. **Subject Property:**
   Parcel 1 – Parcel no. 023939003, Area = 81,243 sq.ft.
   Parcel 2 – Parcel no. 023939002, Area = 55,909 sq.ft.
   Parcel 3 – Parcel no. 023937001, Area = 3,708 sq.ft.
   Parcel 4 – Parcel no. 023939002, Area = 713,694 sq.ft.
   Reference: P.C. F SL. 389, D.B. 2584 PG. 0364, D.B. 1616 PG. 0263.
   Street Address: 0 Shipyard Road, Manns Harbor, NC 27953
   Total Parcel Area = 854,544 sq.ft./19.617 Acres

2. **Current Owner/Developer:**
   Anchor Commercial LLC
   129 Industrial Blvd.,Toano, VA 23168
   Contact: Mike Nice 757-565-2885
   Email: mnice@gnineandsons.com

3. **Engineer:**
   Michael W. Robinson P.E., P.L.S.
   P.O. Box 2852, Kill devil Hills, NC 27948
   Phone: 252-255-8026
   email: mrobinson@obxengineering.com

4. **FEMA Data:**
   Political Area: Dare County CID: 375348 Panel: 9748
   Map number: 3720974800K, Effective Date: 06-19-2020
   Flood Zone: AE (4'), X (0.2%) and X (Minimal Flood Risk)
   Base Flood Elevation: 4' in AE (4') Zone
   Datum: NAVD 1988
   Flood Zones subject to to change by FEMA

5. **Dare County Flood Damage Prevention:**
   REFERENCE LEVEL. For structures within the special flood hazard areas designated as Zones AE and AO the REFERENCE LEVEL is the bottom of the lowest floor or the bottom of the lowest attendant utility including ductwork, whichever is lower, with only flood-resistant materials located below the reference level. For structures within Zones Shaded X or X, the REFERENCE LEVEL is the bottom of the lowest floor or the bottom of the lowest attendant utility including ductwork, whichever is lower, with only flood-resistant materials located below the REFERENCE LEVEL.
   REGULATORY FLOOD PROTECTION ELEVATION (RFPE). In special flood hazard areas, the base flood elevation plus the freeboard for those areas where base flood elevations have been determined on the FIRM; the base flood depth above the highest adjacent grade or local elevation standards for those areas identified as AO Zones of the FIRM, or the local elevation standard for those areas identified as Shaded X or X Zones on the FIRM. For unincorporated Dare County the RFPE is as follows:
   In AE Zones, the RFPE is the base flood elevation as designated on the effective FIRM plus 3 feet of freeboard or an elevation to or above 8 feet NAVD 1988, whichever elevation is greater.
   In Shaded X and X Zones, the RFPE is 8 feet NAVD 1988 or the natural grade elevation if the natural grade is greater than 8 feet NAVD 1988.

6. **Subject Property Zoning:**
   This property lies in Zone MHB, Manns Harbor/Mashoes
   North Adjacent Zoning is MHB and South adjacent Zoning is MHA

7. **MHB Dimensional Standards:**
   Min. Front Setback-25'
   Min. Side Setback-10'
   Min. Rear Setback- 20'
   Min. Rear Yard adjacent to water = n/a
   Maximum Lot Coverage- 30%
   Maximum Building Height = 35'

8. **Proposed Development:**
   Cluster Home Development Consisting of 12-3 bedroom single family residences group LPP drainfields. Plan also includes a boat/RV parking area, playground, boardwalk and a boat ramp.

9. **Cluster Home Ordinance 22-31.1:**
   Cluster home developments consist of more than one residential dwelling on one parcel of land whereby the dwellings are occupied on a long-term basis. These standards are designed to facilitate the development of cluster home projects in unincorporated Dare County subject to the following provisions. The following provisions shall apply.
   Cluster homes developments shall be subject to review and approval as special uses in the MH-A AND MH-B zoning districts
   Minimum lot size: 30,000 square feet in these zoning districts.
   Setbacks: Dwellings constructed as part of a cluster home development shall be subject to the setbacks of the applicable zoning district.
   Separation of dwellings: 15 feet.
   Lot coverage: 30% of the total lot area.
   Building height: Same as the applicable zoning district.
   Maximum size of dwelling: Any dwelling constructed as part of the cluster home development shall not exceed 1,200 square feet of heated/conditioned space.
   Parking: Parking for cluster homes shall be provided at a rate of one parking space per bedroom of each cluster home. Such parking may be provided at individual dwelling sites or in a congregate area for the entire development. Fifty percent (50%) of the required parking shall be of an impervious surface of concrete or asphalt (not to include asphalt millings or other similar products).
   Roads – cluster home developments that cannot be properly served by emergency or service vehicles from an existing abutting road or street, shall be made accessible to such vehicles from a 30' right-of-way with 20 feet of paved improvements.
   Ownership of cluster homes – cluster home sites may be transferred to individual owners with the remainder of the lot dedicated as common area owned by a homeowners association or similar entity. Cluster homes shall be occupied or rented on a for long-term occupancy as defined in Section 22-2 of the Zoning Ordinance.
   A copy of the approved special use permit for a cluster home development shall be recorded with the approved site plan of the development.
   Other reasonable and appropriate conditions to reflect individual specific site conditions may be applied to cluster home development as part of the special use review and approval process.

10. **Proposed Lot Coverage:**
    Buildings – 15 units at 935 sq.ft. each – 14,025 sq.ft.
    Concrete Driveways – 8,181 sq.ft.
    HVAC Stands – 270 sq.ft.
    20' Asphalt Roadway – 14,500 sq.ft.
    Gravel Parking – 13,351 sq.ft.
    Boat Ramp – 620 sq.ft.
    Total Coverage = 37,596 sq.ft.

    Area of Parcel 1 and 2 = 137,152 sq.ft.
    % Lot Coverage of Parcel 1 and 2 = 27.4
    Area of Parcels 1-4 = 854,544 sq.ft.
    % Lot Coverage of Parcel 1-4 = 4.4

NORTH CAROLINA PROFESSIONAL SEAL 18994 ENGINEER MICHAEL W. ROBINSON 04-02-23

THIS PLAN SHOULD BE CONSIDERED PRELIMINARY UNTIL REVIEWED AND APPROVED BY ALL APPLICABLE STATE, TOWN AND COUNTY DEPARTMENTS

GRAPHIC SCALE

60 0 30 60 120 240

(IN FEET)
1 inch = 60 ft.

MICHAEL W. ROBINSON, P.E., P.L.S.
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PHONE: 252-255-8026
EMAIL: mrobinson@obxengineering.com

PRELIMINARY
PROJECT OVERVIEW

NORTH CAROLINA PROFESSIONAL SEAL 18994 ENGINEER MICHAEL W. ROBINSON

REVISIONS

NO.	DATE	DESCRIPTION	BY

PROJECT: ANCHOR COMMERCIAL LLC
MANNS HARBOR DARE COUNTY/MANTEO NORTH CAROLINA

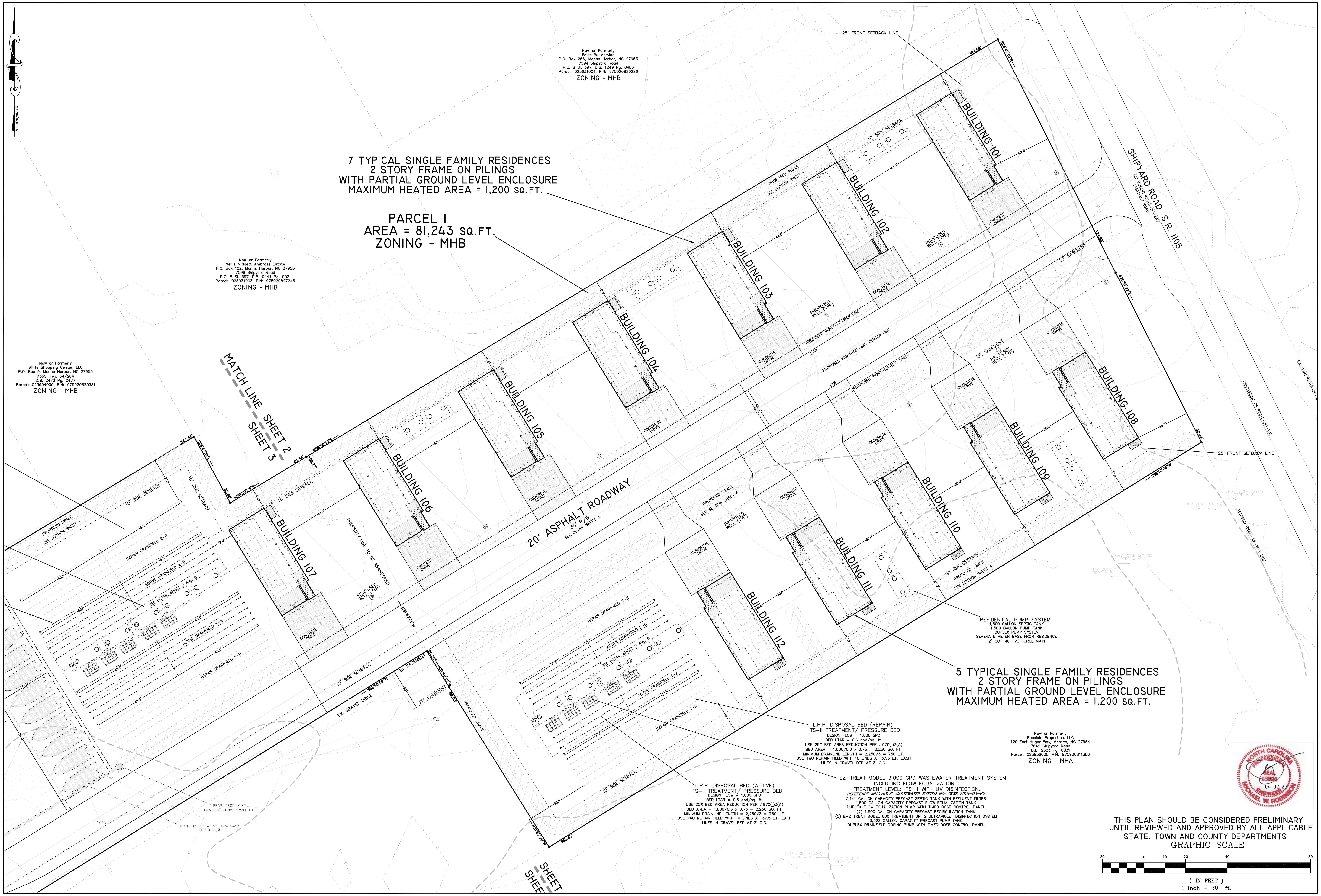
SHIPYARD ROAD RESIDENTIAL DEVELOPMENT

DATE:	SCALE:
04-03-23	1" = 60'
DESIGNED: MWR	DRAWN: MWR

SHEET: 1 OF 6

CAD FILE:

PROJECT NO: 010823-1



Now or Formerly
Brian W. Mervine
P.O. Box 266, Manns Harbor, NC 27953
7594 Shipyard Road
P.C. B Sl. 397, D.B. 1249 Pg. 0486
Parcel: 023931004, PIN: 975920829289
ZONING - MHB
25' FRONT SETBACK LINE
7 TYPICAL SINGLE FAMILY RESIDENCES
2 STORY FRAME ON PILINGS
WITH PARTIAL GROUND LEVEL ENCLOSURE
MAXIMUM HEATED AREA = 1,200 SQ.FT.
PARCEL 1
AREA = 81,243 SQ.FT.
ZONING - MHB
Now or Formerly
Nellie Midgett Ambrose Estate
P.O. Box 102, Manns Harbor, NC 27953
7596 Shipyard Road
P.C. B Sl. 397, D.B. 0444 Pg. 0021
Parcel: 023931003, PIN: 975920827245
ZONING - MHB
Now or Formerly
White Shopping Center, LLC
P.O. Box 9, Manns Harbor, NC 27953
7355 Hwy. 64/264
D.B. 2472 Pg. 0477
Parcel: 023904000, PIN: 975920825381
ZONING - MHB
MATCH LINE - SHEET 2
SHEET 3
SHIPYARD ROAD S.R. 1105
BUILDING 101
BUILDING 102
BUILDING 103
BUILDING 104
BUILDING 105
BUILDING 106
BUILDING 107
BUILDING 108
BUILDING 109
BUILDING 110
BUILDING 111
BUILDING 112
20' ASPHALT ROADWAY
30' R/W
SEE SECTION SHEET 4
PROPOSED SWALE
10' SIDE SETBACK
20' EASEMENT
CONCRETE DRIVE
PROPOSED WELL (TYP)
PROPERTY LINE TO BE ABANDONED
EX. GRAVEL DRIVE
REPAIR DRAINFIELD 2-B
ACTIVE DRAINFIELD 2-B
ACTIVE DRAINFIELD 1-A
REPAIR DRAINFIELD 1-B
SEE DETAIL SHEET 5 AND 6
RESIDENTIAL PUMP SYSTEM
1,500 GALLON SEPTIC TANK
1,500 GALLON PUMP TANK
DUPLEX PUMP SYSTEM
SEPERATE METER BASE FROM RESIDENCE
2" SCH 40 PVC FORCE MAIN
5 TYPICAL SINGLE FAMILY RESIDENCES
2 STORY FRAME ON PILINGS
WITH PARTIAL GROUND LEVEL ENCLOSURE
MAXIMUM HEATED AREA = 1,200 SQ.FT.
L.P.P. DISPOSAL BED (REPAIR)
TS-II TREATMENT/ PRESSURE BED
DESIGN FLOW = 1,800 GPD
BED LTAR = 0.6 gpd/sq. ft.
USE 25% BED AREA REDUCTION PER .1970(j)3(A)
BED AREA = 1,800/0.6 x 0.75 = 2,250 SQ. FT.
MINIMUM DRAINLINE LENGTH = 2,250/3 = 750 L.F.
USE TWO REPAIR FIELD WITH 10 LINES AT 37.5 L.F. EACH
LINES IN GRAVEL BED AT 3' O.C.
L.P.P. DISPOSAL BED (ACTIVE)
TS-II TREATMENT/ PRESSURE BED
DESIGN FLOW = 1,800 GPD
BED LTAR = 0.6 gpd/sq. ft.
USE 25% BED AREA REDUCTION PER .1970(j)3(A)
BED AREA = 1,800/0.6 x 0.75 = 2,250 SQ. FT.
MINIMUM DRAINLINE LENGTH = 2,250/3 = 750 L.F.
USE TWO REPAIR FIELD WITH 10 LINES AT 37.5 L.F. EACH
LINES IN GRAVEL BED AT 3' O.C.
EZ-TREAT MODEL 3,000 GPD WASTEWATER TREATMENT SYSTEM
INCLUDING FLOW EQUALIZATION
TREATMENT LEVEL: TS-II WITH UV DISINFECTION.
REFERENCE INNOVATIVE WASTEWATER SYSTEM NO: IWWS 2015-03-R2
3,141 GALLON CAPACITY PRECAST SEPTIC TANK WITH EFFLUENT FILTER
1,500 GALLON CAPACITY PRECAST FLOW EQUALIZATION TANK
DUPLEX FLOW EQUALIZATION PUMP WITH TIMED DOSE CONTROL PANEL
(2) 1,500 GALLON CAPACITY PRECAST RECIRCULATION TANK
(5) E-Z TREAT MODEL 600 TREATMENT UNITS ULTRAVIOLET DISINFECTION SYSTEM
3,528 GALLON CAPACITY PRECAST PUMP TANK
DUPLEX DRAINFIELD DOSING PUMP WITH TIMED DOSE CONTROL PANEL
Now or Formerly
Possible Properties, LLC
120 Fort Hugar Way, Manteo, NC 27954
7642 Shipyard Road
D.B. 2323 Pg. 0831
Parcel: 023936000, PIN: 975920811386
ZONING - MHA
FIRM ZONE X(0.2%)
RFPE = 8'
FIRM ZONE X
RFPE = 8'

THIS PLAN SHOULD BE CONSIDERED PRELIMINARY
UNTIL REVIEWED AND APPROVED BY ALL APPLICABLE
STATE, TOWN AND COUNTY DEPARTMENTS

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

MICHAEL W. ROBINSON, P.E., P.L.S.
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EMAIL: mrobinson@obxengineering.com

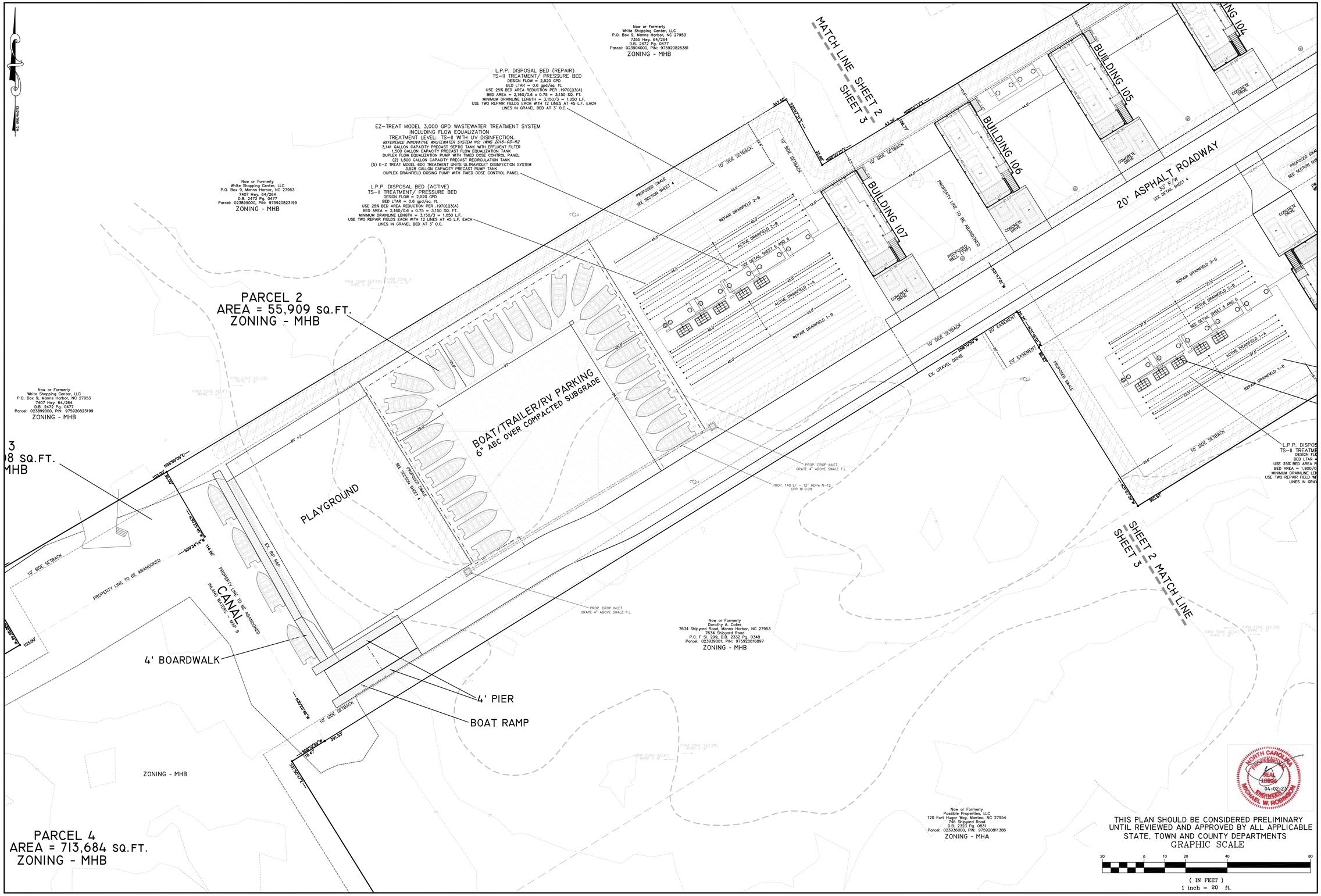
PRELIMINARY SITE PLAN

REVISIONS

NO.	DATE	DESCRIPTION	BY

PROJECT: ANCHOR COMMERCIAL LLC
MANNS HARBOR DARE COUNTY/MANTEO NORTH CAROLINA
SHIPYARD ROAD RESIDENTIAL DEVELOPMENT

DATE: 04-03-23	SCALE: 1" = 20'
DESIGNED: MWR	DRAWN: MWR
SHEET: 2 OF 6	
CAD FILE:	
PROJECT NO: 010823-1	



THIS PLAN SHOULD BE CONSIDERED PRELIMINARY UNTIL REVIEWED AND APPROVED BY ALL APPLICABLE STATE, TOWN AND COUNTY DEPARTMENTS

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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PRELIMINARY
SITE PLAN

NORTH CAROLINA PROFESSIONAL SEAL 18994 ENGINEER MICHAEL W. ROBINSON

REVISIONS			
NO.	DATE	DESCRIPTION	BY

PROJECT:
ANCHOR COMMERCIAL LLC
MANNS HARBOR DARE COUNTY/MANTEO NORTH CAROLINA
SHIPYARD ROAD RESIDENTIAL DEVELOPMENT

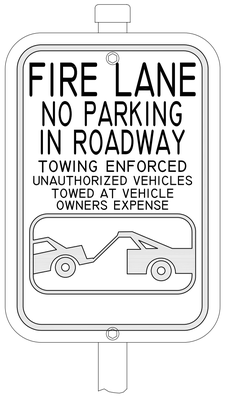
DATE: 04-03-23	SCALE: 1" = 20'
DESIGNED: MWR	DRAWN: MWR
SHEET: 3 OF 4	
CAD FILE:	
PROJECT NO: 010823-1	

SOIL EROSION & SEDIMENTATION CONTROL PLAN NOTES:

1. SOIL EROSION & SEDIMENT CONTROL PLAN NOTES;
   a.) AREA TO BE DISTURBED: ±37,000 sq.ft. (0.85 ac.)
   b.) PROVIDE A GROUND COVER (TEMPORARY OR PERMANENT) ON ALL SLOPES 3:1 OR STEEPER WITHIN 7 CALENDAR DAYS AND ALL SLOPES FLATTER THAN 3:1 WITHIN 14 CALENDAR DAYS FOLLOWING COMPLETION OF ANY PHASE OF GRADING. PROVIDE A PERMANENT GROUND COVER FOR ALL DISTURBED AREAS WITHIN 15 WORKING DAYS OR 90 CALENDAR DAYS (WHICHEVER IS SHORTER) FOLLOWING COMPLETION OF CONSTRUCTION OR DEVELOPMENT
   c.) IF LAND DISTURBING ACTIVITIES OCCUP

& TEMP. SEEDING SPECIFICATIONS ON SHEET ES2).

   d.) IF EXCESSIVE WIND EROSION OR STORMWATER RUNOFF EROSION DEVELOPS DURING TIME OF CONSTRUCTION ANY LOCATION ON THE PROJECT SITE, ADDITIONAL SILT FENCING OR OTHER MEASURES SHALL BE INSTALLED AS DIRECTED BY ENGINEER SO AS TO PREVENT DAMAGE TO ADJACENT PROPERTY. SEE SILT FENCE DETAIL ON THIS SHEET.
   e.) SOIL EROSION AND SEDIMENTATION CONTROLS ARE TO BE INSPECTED WEEKLY AND AFTER ANY SIGNIFICANT RAINFALL PRODUCING EVENT AND SHALL BE MAINTAINED AND REPAIRED AS NECESSARY UNTIL PERMANENT CONTROLS ARE ESTABLISHED.
   f.) CONSTRUCTION SCHEDULE:
      1) OBTAIN PLAN APPROVAL AND OTHER APPLICABLE PERMITS. NO WORK SHALL BE PERFORMED IN WETLAND AREAS PRIOR TO ISSUANCE OF ALL APPLICABLE USACE PERMITS.
      2) FLAG AND/OR ROUGH STAKE WORK LIMITS.
      3) HOLD PRECONSTRUCTION CONFERENCE (OWNER, CONTRACTOR, ENGINEER, AND APPROPRIATE GOVERNMENT OFFICIALS) AT LEAST ONE WEEK PRIOR TO START OF CONSTRUCTION ACTIVITIES.
      4) INSTALL SILT FENCING AT LOCATIONS SHOWN ON PLAN
      5) COMPLETE CLEARING AND GRUBBING PROCEDURES.
      6) GRADE SITE ACCORDING TO PLAN
      7) INSTALL INFILTRATION BASINS AND STORM SEWER. DROP INLETS TO BE PROTECTED WITH INLET PROTECTION UNTIL CONTRIBUTING DRAINAGE AREAS ARE STABILIZED. PIPE ENDS AT INFILTRATION BASINS SHALL BE PROTECTED WITH OUTLET PROTECTION.
      8) INSTALL PERMEABLE PAVEMENT GRAVEL BASE. BASE LAYER TO BE PROTECTED FROM SEDIMENT AT ALL TIMES. CONSTRUCTION TRAFFIC TO BE RESTRICTED TO SPECIFIC AREAS WITHIN THE BASE (STAGING / WORK AREA TO BE DEFINED BY CONTRACTOR AND CLEARLY DEMARCATED UTILIZING BARRIERS/CONES/TAPE). ONCE HEAVY BUILDING CONSTRUCTION IS COMPLETE, STAGING / WORK AREA BASE MATERIAL WILL BE INSPECTED BY ENGINEER AND IF FOUND TO BE DEGRADED, IT SHALL BE REMEDIATED AT THE EXPENSE OF THE CONTRACTOR. INSTALLATION OF PERMEABLE CONCRETE PAVEMENT SHALL NOT TAKE PLACE UNTIL ALL EARTHWORK ACTIVITIES AND ALL HEAVY BUILDING CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED. INSTALLED PERMEABLE CONCRETE SHALL BE PROTECTED FROM SEDIMENT AND FROM HEAVY CONSTRUCTION EQUIPMENT AT ALL TIMES.
      9) ALL EROSION & SEDIMENTATION CONTROL PRACTICES WILL BE INSPECTED WEEKLY AND AFTER HEAVY RAINFALL EVENTS. NEEDED REPAIRS WILL BE MADE IMMEDIATELY.
      10) ONCE SITE IS FULLY STABILIZED; REMOVE INLET AND OUTLET PROTECTION, CLEAN STORM SEWER OF ANY SEDIMENT, FINE-GRADE AND SEED OR LANDSCAPE INFILTRATION BASINS.



SIGN-NO PARKING FIRE LANE

PERMANENT VEGETATION

SEEDING DATES: APRIL 1– SEPT 30

SEED MIXTURE	APPLICATION RATES/ACRE
BAHIA	50 LBS.
COMMON BERMUDA (UNHULLED)	50 LBS.
GERMAN MILLETT	15 LBS.
FESCUE	20 LBS.
FERTILIZER 26–13–13 @ 500 LB/ACRE	
MULCH APPLY 4,000 LB/ACRE STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.	

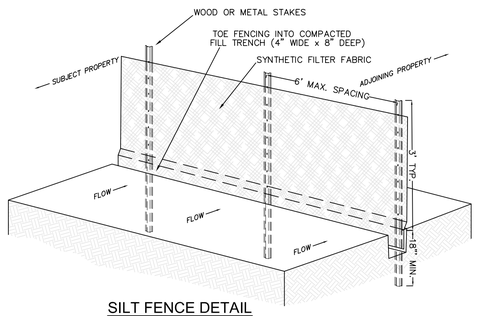
TEMPORARY VEGETATION

SEEDING DATES: OCT. 1 – MARCH 31

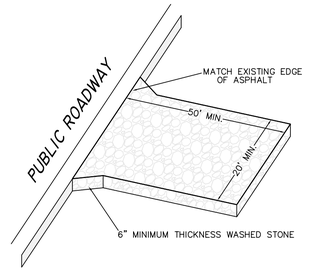
SEED MIXTURE	APPLICATION RATES/ACRE
RYE GRAIN	175 LBS.
FERTILIZER 10–10–10 @ 1000 LB/ACRE	
MULCH APPLY 4,000 LB/ACRE STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.	

GENERAL: FERTILIZER RATES SHOWN ARE GENERAL RECOMMENDATIONS; FREQUENCY AND AMOUNT OF FERTILIZATION CAN BEST BE DETERMINED THROUGH SITE SPECIFIC SOIL TESTING.
MAINTENANCE: SATISFACTORY STABILIZATION AND EROSION CONTROL REQUIRES A COMPLETE VEGETATIVE COVER. EVEN SMALL BREACHES IN VEGETATIVE COVER CAN EXPAND RAPIDLY AND, IF LEFT UNATTENDED, CAN ALLOW SERIOUS SOIL LOSS FROM AN OTHERWISE STABLE SURFACE. A SINGLE HEAVY RAIN IS OFTEN SUFFICIENT TO GREATLY ENLARGE BARESPOTS, AND THE LONGER REPAIRS ARE DELAYED, THE MORE COSTLY THEY BECOME. PROMPT ACTION WILL KEEP SEDIMENT LOSS AND REPAIR COST DOWN.
NEW SEEDLINGS SHOULD BE INSPECTED FREQUENTLY AND MAINTENANCE PERFORMED AS NEEDED. IF RILLS AND GULLIES DEVELOP, THEY MUST BE FILLED IN, RE-SEEDED,AND MULCHED AS SOON AS POSSIBLE. DIVERSIONS MAY BE NEEDED UNTIL NEW PLANTS TAKE HOLD.
MAINTENANCE REQUIREMENTS EXTEND BEYOND THE SEEDING PHASE.
WEAK OR DAMAGED SPOTS MUST BE RELIMED, FERTILIZED, MULCHED, AND RESEEDED AS PROMPTLY AS POSSIBLE. REFERTILIZATION MAY BE NEEDED TO MAINTAIN PRODUCTIVE STANDS.

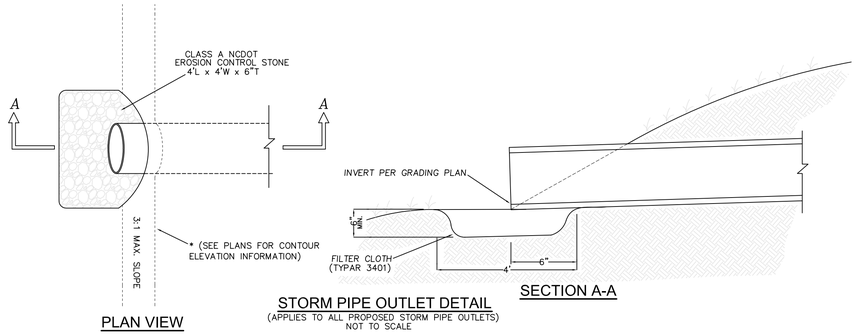
SEEDING SPECIFICATIONS



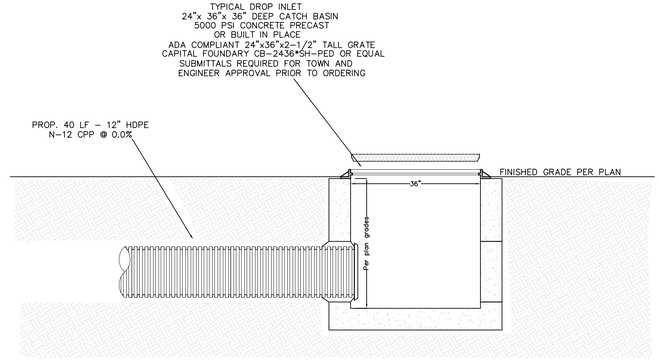
SILT FENCE DETAIL
NOT TO SCALE



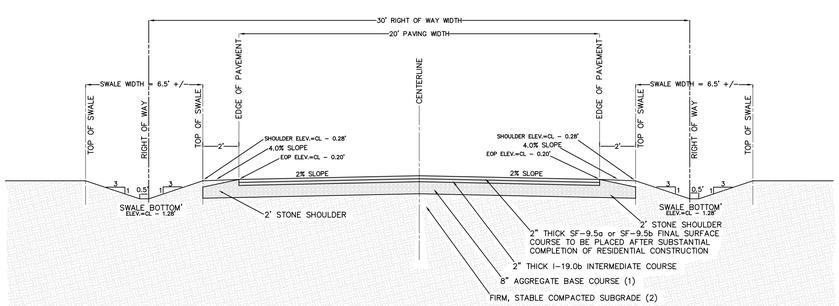
GRAVEL CONSTRUCTION ENTRANCE DETAIL
NOT TO SCALE



PLAN VIEW — STORM PIPE OUTLET DETAIL (APPLIES TO ALL PROPOSED STORM PIPE OUTLETS) NOT TO SCALE — SECTION A-A



DETAIL - PROPOSED DROP INLET TYPICAL
NOT TO SCALE



TYPICAL ROADWAY AND SWALE SECTION
NOT TO SCALE

(1) NCDOT ABC materials compacted to a dry density of at least 100% of the Standard Proctor maximum dry density (ASTM D698)
(2) Subgrade soils compacted to a dry density of at least 100% of the Standard Proctor maximum dry density (ASTM D698)

MICHAEL W. ROBINSON, P.E., P.L.S.
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EMAIL: mrobinson@obxengineering.com

PRELIMINARY
DETAIL SHEET

NORTH CAROLINA PROFESSIONAL SEAL 18994 ENGINEER MICHAEL W. ROBINSON

REVISIONS

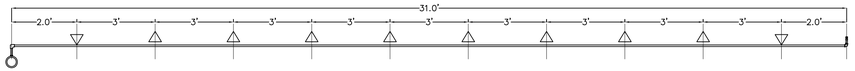
NO.	DATE	DESCRIPTION	BY

PROJECT:
ANCHOR COMMERCIAL LLC
MANNS HARBOR — DARE COUNTY/MANTEO — NORTH CAROLINA
SHIPYARD ROAD RESIDENTIAL DEVELOPMENT

DATE:	SCALE:
04-03-23	1" = 20'
DESIGNED: MWR	DRAWN: MWR

SHEET: 4 OF 6
CAD FILE:
PROJECT NO: 010823-1

NORTH CAROLINA PROFESSIONAL SEAL 18994 ENGINEER MICHAEL W. ROBINSON 04-02-23

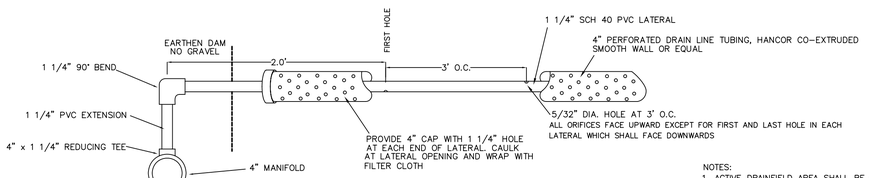


△ HOLE ON TOP OF PIPE (UP)
▽ HOLE ON BOTTOM OF PIPE (DOWN)
ALL HOLES 5/32" DIA. HOLE
REMOVE ALL BURRS AND DRILL DEBRIS

L.P.P. FIELD LATERAL HOLE LAYOUT

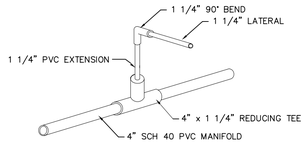
PROFILE

THIS SYSTEM USES 5/32" DIAMETER ORIFICES
ALL LATERALS TO BE INSTALLED LEVEL



L.P.P. FIELD LATERAL SECTION

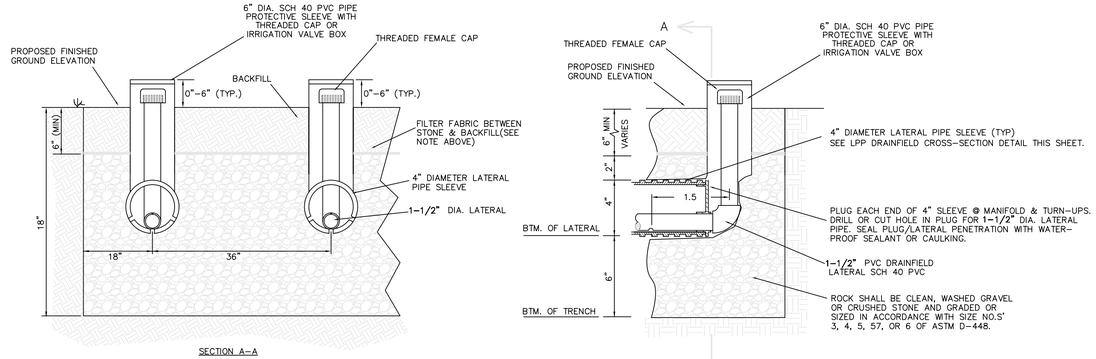
PROFILE



L.P.P. FIELD LATERAL CONNECTION DETAIL

NOT TO SCALE

NOTES:
1. ACTIVE DRAINFIELD AREA SHALL BE GRADED SO THAT STORMWATER RUNOFF DOES NOT POND ON DRAINFIELD AREA.
2. VEGETATE DRAINFIELD AND REPAIR AREAS WITH SUITABLE PERMANENT SPECIES
3. FILTER FABRIC SHALL BE TREVIRA SPUNBOND TYPE 1112 ENGINEERING FABRIC OR EQUAL AS APPROVED BY ENGINEER.
4. ALL TRENCHES, LATERALS, AND MANIFOLDS SHALL BE INSTALLED LEVEL.



LATERAL TURN-UP & TRENCH X-SECTION

N.T.S.

EZ-TREAT MODEL 3,000 GPD WASTEWATER TREATMENT SYSTEM
INCLUDING FLOW EQUALIZATION
TREATMENT LEVEL: TS-II WITH UV DISINFECTION.
REFERENCE INNOVATIVE WASTEWATER SYSTEM NO: IWWS 2015-03-R2
3,141 GALLON CAPACITY PRECAST SEPTIC TANK WITH EFFLUENT FILTER
1,500 GALLON CAPACITY PRECAST FLOW EQUALIZATION TANK
DUPLEX FLOW EQUALIZATION PUMP WITH TIMED DOSE CONTROL PANEL
(2) 1,500 GALLON CAPACITY PRECAST RECIRCULATION TANK
(5) E-Z TREAT MODEL 600 TREATMENT UNITS
ULTRAVIOLET DISINFECTION SYSTEM
3,528 GALLON CAPACITY PRECAST PUMP TANK
DUPLEX DRAINFIELD DOSING PUMP WITH TIMED DOSE CONTROL PANEL

THE PRETREATMENT SYSTEM SHOWN HEREON MUST BE DESIGNED, INSTALLED AND OPERATED IN ACCORDANCE WITH NCDENR, DIVISION OF ENVIRONMENTAL HEALTH, INNOVATIVE WASTEWATER SYSTEM APPROVAL NO: IWWS 2015-03-R1.

A PRE-CONSTRUCTION CONFERENCE SHALL BE HELD PRIOR TO INSTALLATION OF THE TREATMENT SYSTEM. THIS CONFERENCE SHALL BE SCHEDULED BY THE CONTRACTOR AND SHALL INCLUDE ATTENDANCE BY THE DESIGN ENGINEER, LOCAL HEALTH DEPARTMENT AND THE EZ-TREAT CERTIFIED CERTIFIED INSTALLER. THIS SYSTEM WILL REQUIRE A SUBSURFACE OPERATOR APPROVED BY EZ-TREAT. REFER TO INNOVATIVE APPROVAL AND SHEET 3 FOR INSPECTION FREQUENCY, TESTING AND REPORTING REQUIREMENTS.

E-Z TREAT

INSTALLATION AND TESTING:

1. A preconstruction conference shall be required to be attended by the designer authorized in writing by E-Z Treat Company, engineer, installer authorized in writing by E-Z Treat Company, and LHD prior to beginning construction of the E-Z Treat Pretreatment system.

2. All E-Z Treat Pretreatment systems shall be installed according to directions provided by E-Z Treat Company. Additionally, all E-Z Treat Pretreatment systems and components used with, but not manufactured by E-Z Treat Company shall be installed in accordance with all applicable regulations and manufacturer instructions.

3. All individuals/companies installing E-Z Treat Pretreatment systems shall be in possession of all necessary permits and licenses before attempting any portion of a new or repair installation. The company/individual must be a Level IV installer and authorized in writing by E-Z Treat Company.

4. Watertightness of the tanks shall be tested by the following protocol:
24-hour hydrostatic test.
1. Hydrostatic Test Procedure:
a. Temporarily seal the inlet and outlet pipes.
b. Fill tank with clean water the top of the tank
c. Measure the water level.
d. Allow the tank to sit for 24 hours.
e. Re-measure the water level.
f. If the water level change is ½-inch or less or one percent of the liquid tank capacity, the tank passes the leak test.
g. If the water level change is greater than ½-inch, any visible leaks can be repaired and the tank may be topped off with water and allowed to sit for a minimum of one hour.
h. The tank passes the leak test if there are no visible leaks (flowing water or dripping in a steady stream) and no measureable drop in water level after one hour. Otherwise, the tank fails the leak test.

5. The distribution of flow to the E-Z Treat Pretreatment system and to the septic tank shall be measured during start-up and set to be in accordance with the system design with start-up settings recorded.

6. Specified site preparation steps and construction specifications for the ground absorption system shall be strictly adhered to, including specified depth of trenches in relation to site limiting conditions, cover material specifications (if needed), trench installation method, etc.

7. The installer authorized in writing by E-Z Treat Company, the engineer or designer authorized in writing by E-Z Treat Company, and the ORC authorized in writing by E-Z Treat Company shall conduct an inspection/start-up of the E-Z Treat Pretreatment system and all associated system components. The LHD personnel will attend and observe the inspection/start-up. During the inspection/start-up to include:
1. System watertightness testing.
2. Control panel operation and alarm settings.
3. Pump model numbers and time clock settings.
4. Pressure head on the E-Z Treat pod wastewater distribution system.
5. Return flow to the septic tank set per design and recorded, when applicable.
6. Riser hatches have tamperproof bolts, and/or riser lock ring.

WASTEWATER SYSTEM DESIGN DATA:

DESIGN FLOW = 1,815 GPD MAXIMUM
DEPTH TO SEASONAL HIGH WATER TABLE = 12" BLS
SOIL TYPE - SINGLE GRAINED LOOSE SAND (TYPE 1)
DUE TO LOT AREA CONSTRAINTS, A PRE-TREATMENT SYSTEM WILL BE UTILIZED ALONG WITH A L.P.P. PRESSURE DOSED DRAINFIELD LOADED AT 1.2 GPD/SQ. FT. AND A 40% TS-II DRAINFIELD REDUCTION.
TIMED DOSING OF DRAINFIELD AND UV DISINFECTION WILL BE REQUIRED.

PROPOSED TREATMENT LEVEL - TS-II

Parameter	Effluent Quality Standard
CBOD	L.T. 10 mg/l
TSS	L.T. 10 mg/l
NH4-N	L.T. 10 mg/l
TN	L.T. 20 mg/l or 60% removal
Fecal Coliform	L.T. 1,000 colonies/100 ml

L.P.P. BED SIZING PER FIELD (2 FIELDS TOTAL):
BED LTAR = 1.2 GPD/SQ. FT.
USE 40" BED AREA REDUCTION PER .1970(j)3(A)
BED AREA REQUIRED = 908/1.2 x 0.60 = 454 SQ. FT.
MINIMUM DRAINLINE LENGTH = 1,260/3 = 152 L.F. ON 3.0' O.C.
USE 5 SLEEVED LATERALS AT 3' O.C., EACH LATERAL 31.0 L.F.
TOTAL LATERAL LENGTH = 155 L.F.
EACH LINE TO HAVE 10 - 5/32" HOLES.
SEE DETAIL FOR HOLE LAYOUT AND ORIENTATION
REMOVE ALL DRILL BURRS AND DEBRIS FROM PIPE AFTER DRILLING
LATERAL DIAMETER = 1-1/4" SCH 40 PVC LATERAL SLEEVE
4" PERFORATED DRAINLINE TUBING BY HANCOR OR EQ.

SEPTIC AND PUMP TANK: SEE PLAN FOR TANK SPECIFICS AND DIMENSIONS
USE STATE APPROVED PRECAST TANKS
SUBMIT TANK SPECIFICATIONS TO ENGINEER FOR APPROVAL PRIOR TO ORDERING
ALL TANKS AND CONNECTIONS TO BE LEAKED TESTED PRIOR TO BEING PLACED IN SERVICE. APPROVAL BY ENGINEER AND HEALTH DEPARTMENT REQUIRED.

PUMP DESIGN FLOW:
DESIGN PRESSURE HEAD AT DRAINFIELD = 3 FT.
HOLE DIAMETER = 5/32"
NUMBER OF HOLES PER LATERAL = 10
TOTAL NUMBER OF HOLES = 10 x 5 = 50
FLOW PER HOLE AT 3 FT FIELD PRESSURE HEAD = 0.5 GPM/HOLE
TOTAL PUMP FLOW AT DESIGN PRESSURE HEAD = 25.0 GPM
L.P.P. MANIFOLD:
USE 4" SCH 40 PVC MANIFOLD. SEE DETAIL FOR CONFIGURATION DETAILS
FORCE MAIN:
USE 2" SCH 40 PVC FORCE MAIN FROM PUMP TO MANIFOLD
SEE DETAIL FOR PUMP INSTALLATION AND VALVING
MAINTAIN 2' MINIMUM COVER IN FORCE MAIN
PUMP SELECTION:

Q =CALCULATED FLOW (GPD) DESIGN POINT = 25.0 GPM
H_1 =STATIC HEAD AT FIELD = 3.0
H_2 =ELEVATION HEAD = 7.0
L_{eq} =EQUIVALENT LENGTH OF FORCE MAIN = 311 L.F. + 25% = 390 L.F.
d =FORCE MAIN DIAMETER (IN.) = 2
C =PIPE COEFFICIENT = 130

H_f =FRICTION HEAD = $\frac{10.44\ (L_{EQ})Q^{1.85}}{C^{1.85}\ d^{4.8655}} = 0.0171518(Q)^{1.85}$

TDH = $H_1 + H_2 + H_f$

OPERATING POINT	Q (GPM)	TDH (FT)	Q (GPM)	TDH (FT)
	10	11.2	40	25.8
	20	14.4	50	33.8
	25	**16.6**	60	43.4
	30	19.3	70	54.4

PUMP:
USE DUPLEX MYERS ME-50, 1/2 HP PUMPS OPERATING AT 25.0 GPM @ 16.6 FT. TDH WITH 2" VERTICAL DISCHARGE. PUMP REQUIRES A 230 VOLT SINGLE PHASE POWER SUPPLY. SEE DETAIL SHEET FOR ADDITIONAL DATA - OR APPROVED EQUAL (ADDITIONAL HEAD REQUIRED BY PARTIAL VALVE CLOSURE)

WASTEWATER SYSTEM CONTRACTOR MUST BE APPROVED BY EZ-TREAT
NO MATERIAL SUBSTITUTIONS ALLOWED WITHOUT PRIOR WRITTEN APPROVAL BY EZ-TREAT COMPANY AND ENGINEER

FORCE MAIN INSTALLATION AND TESTING

FORCE MAIN SANITARY SEWER
Construct force main sewers in conformance with NCDENR Minimum Design Criteria for the Fast-Track Permitting of Pump Stations and Force Mains.

INSTALLATION GENERAL
Install lines with 36" to 42" of cover to finished grade unless otherwise directed or approved. Install lines with greater cover for short distances to accommodate utility controls, to make tie-ins to existing facilities, to eliminate high points in the pipeline or to provide clearance from existing or proposed utilities, drainage, other obstacles or actual field conditions

PRESSURE TESTING
1. A HYDROSTATIC PRESSURE TEST SHALL BE PERFORMED ON EACH SEGMENT OF INSTALLED FORCE MAIN.
2. THE TEST SHALL BE PERFORMED AFTER THE FORCE MAIN HAS BEEN BACKFILLED AND AT LEAST SEVEN DAYS FOLLOWING THE POURING OF THE LAST THRUST BLOCK.
3. THE FOLLOWING PROCEDURES SHALL BE FOLLOWED IN PERFORMING HYDROSTATIC PRESSURE TESTS ON FORCE MAINS:
   a. THE FORCE MAIN SEGMENT SHALL BE CAREFULLY FILLED WITH WATER AT A VELOCITY OF APPROXIMATELY ONE FOOT PER SECOND. WATER MAY BE INTRODUCED FROM EITHER THE PUMP STATION OR A TEMPORARY CONNECTION MADE IN THE FORCE MAIN. APPROPRIATE MEASURES NECESSARY TO ELIMINATE ALL AIR FROM THE FORCE MAIN SHALL BE TAKEN DURING THIS PROCESS.
   a. ONCE FULL OF WATER, THE FORCE MAIN SEGMENT SHALL BE PRESSURIZED AND ALLOWED TO STABILIZE AT A MINIMUM TEST PRESSURE OF 1.5 TIMES THE MAXIMUM DESIGN PRESSURE OF THE FORCE MAIN PIPE MATERIAL.
   b. THIS PRESSURE SHALL BE MAINTAINED FOR AT LEAST TWO CONSECUTIVE HOURS.
   e. IF THE STATED PRESSURE CANNOT BE MAINTAINED, THE APPLICANT IS RESPONSIBLE FOR ASSURING THAT THE CAUSE OF TEST FAILURE IS DETERMINED, ALL NECESSARY REPAIRS ARE MADE, AND REPEATING THE HYDROSTATIC PRESSURE TEST UNTIL THE FORCE MAIN SEGMENT PASSES.

THE PRESSURE TEST MAY BE PERFORMED CONCURRENTLY OR SEPARATELY WITH THE LEAKAGE TEST AS NOTED BELOW

LEAKAGE TESTING
1. A LEAKAGE TEST SHALL BE PERFORMED ON EACH SEGMENT OF INSTALLED FORCE MAIN AT THE HYDROSTATIC PRESSURE TEST STIPULATED ABOVE
2. LEAKAGE SHALL BE DEFINED AS THE QUANTITY OF WATER REQUIRED TO MAINTAIN A PRESSURE WITHIN FIVE POUNDS PER SQUARE INCH OF THE SPECIFIED TEST PRESSURE AFTER THE PIPE HAS BEEN FILLED WITH WATER AND ALL AIR HAS BEEN EXPELLED.
3. LEAKAGE SHALL BE MEASURED WITH A CALIBRATED TEST METER AND SHALL NOT EXCEED THE AMOUNT GIVEN BY THE FOLLOWING FORMULA:

$$L = \frac{SD\sqrt{P}}{133{,}200}$$

S = LENGTH OF PIPE (FEET)
L = LEAKAGE (GPH)
D = NOMINAL DIAMETER OF PIPE SEGMENT TESTED (INCHES)
P = TEST PRESSURE (POUNDS PER SQUARE INCH)

ALL VISIBLE LEAKS SHALL BE REPAIRED REGARDLESS OF THE AMOUNT OF LEAKAGE. IF LEAKAGE EXCEEDS THIS RATE, THE APPLICANT IS RESPONSIBLE FOR ASSURING THAT THE CAUSE OF TEST FAILURE IS DETERMINED, ALL NECESSARY REPAIRS ARE MADE, AND REPEATING THE TEST UNTIL THE FORCE MAIN SEGMENT PASSES.
4. THE LEAKAGE TEST MAY BE PERFORMED CONCURRENTLY OR SEPARATELY WITH THE

PVC AND PE MATERIAL STANDARDS

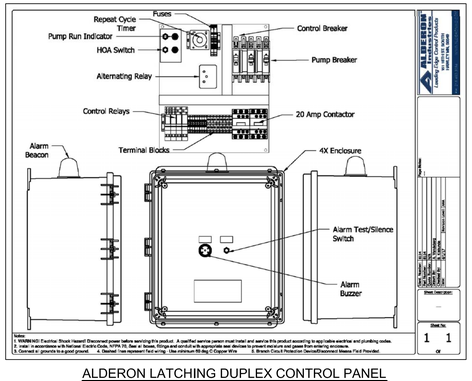
Pressure Rated Pipe
Use PVC pipe conforming to ASTM D2241 or to ANSI/AWWA C905 with a minimum SDR of 21 and minimum pressure rating of 200 psi. Use pipe with push-on type joints having bells made as an integral part of the pipe conforming to ASTM D3139 or pipe with butt fused joints made from ASTM D1784 Class 12454B plastic formulated for fusing.

Pressure Class Pipe
Use PVC pipe conforming to ANSI/AWWA C900 with a minimum DR of 18 and a minimum pressure class of 235 psi. Use pipe with push-on type joints having bells made as an integral part of the pipe conforming to ASTM D3139 or pipe with
butt-fused joints made from ASTM D1784 Class 12454B plastic formulated for fusing.

Polyethylene (PE) Pipe
Use PE water pipe and tubing that conforms to AWWA C901 or AWWA C906 with a DR = 9 and minimum pressure class of 250 psi.

OWNER NOTIFICATION REGARDING OPERATION AND MAINTENANCE REQUIREMENTS:

1. IN ACCORDANCE WITH 15A NCAC 18A.1961 THIS WASTEWATER SYSTEM HAS A TYPE IV SYSTEM CLASSIFICATION WHICH REQUIRES A CONTRACT FOR OPERATIONS FROM A PUBLIC MANAGEMENT ENTITY WITH A CERTIFIED OPERATOR OR A CONTRACT FOR OPERATIONS WITH A PRIVATE CERTIFIED OPERATOR. THE OPERATOR SELECTED SHALL BE IN GOOD STANDING WITH THE DARE COUNTY HEALTH DEPARTMENT.
2. THIS SYSTEM REQUIRES INSPECTIONS BY THE CONTRACT OPERATOR AT A MINIMUM OF TWICE PER YEAR.
3. THIS SYSTEM REQUIRES REPORTING TO THE DARE COUNTY HEALTH DEPARTMENT ON A YEARLY BASIS. ALL REPORTS SHALL BE SUBMITTED DIRECTLY BY THE OPERATOR TO THE DARE COUNTY HEALTH DEPARTMENT WITH REPORT COPIES PROVIDED TO THE PROPERTY OWNER.
4. THE REQUIRED INSPECTIONS SHALL AT A MINIMUM INCLUDE THE FOLLOWING:
   A. OPERATOR SHALL MAINTAIN A WRITTEN LOG OF ALL INSPECTIONS INCLUDING DATE AND TIME OF INSPECTION AND ALL SYSTEM FINDINGS. THE LOG SHALL BE MADE AVAILABLE TO THE OWNER, DARE COUNTY HEALTH DEPARTMENT AND ENGINEER UPON REQUEST.
   B. TWICE YEARLY-VISUALLY INSPECT THE DRAINFIELD AREA TO CHECK FOR EVIDENCE OF SURFACED WASTEWATER INCLUDING DEBRIS, PONDING OR EXCESSIVELY GREEN VEGETATION AREAS. NOTIFY PROPERTY OWNER IF VEGETATION AND LANDSCAPING HAS BEEN ALLOWED TO ENCROACH ONTO THE DRAINFIELD.
   C. TWICE YEARLY-MANUALLY OPERATE ALL FLOATS AND CONTROLS TO ENSURE BOTH PUMPS ARE FUNCTIONING, DUPLEX ALTERNATING DOSING IS OCCURRING AND ALARMS ARE FUNCTIONING AS DESIGNED.
   D. YEARLY - MEASURE THE SLUDGE DEPTH IN THE SEPTIC TANK AND PUMP TANK AND PUMP BOTH TANKS AS REQUIRED WHEN SLUDGE LEVELS REACH ⅓ LIQUID DEPTH IN THE SEPTIC TANK.
   E. YEARLY - THE DRAINFIELD LATERALS SHALL BE FLUSHED UNTIL ALL SLUDGE AND DEBRIS IS CLEAR. AFTER FLUSHING THE LATERALS, RESET THE PRESSURE HEAD AT THE DRAINFIELD. MEASURE THE DRAW DOWN RATES WITHIN THE PUMP TANK. THE DRAW DOWN RATES SHALL BE COMPARED TO DESIGN RATES. SOME CREEP IN RATES IS EXPECTED AS THE SYSTEM AGES BUT NOTIFY DARE COUNTY HEALTH DEPARTMENT, OWNER AND ENGINEER IF RATES VARY SUDDENLY OR SIGNIFICANTLY.

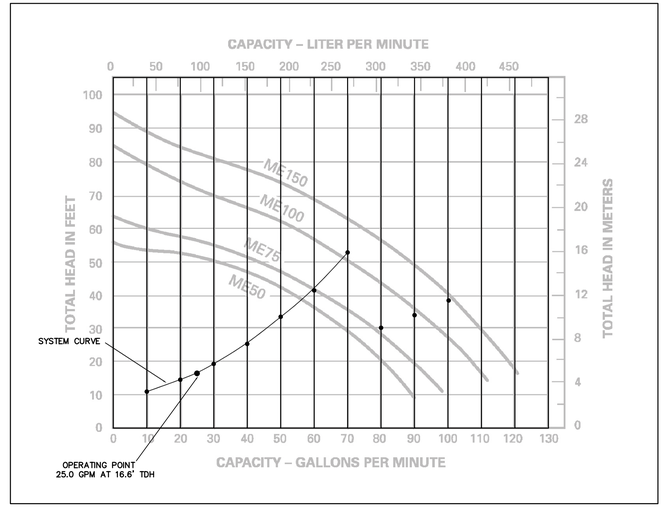


ALDERON LATCHING DUPLEX CONTROL PANEL
ADD ETM AND CYCLE COUNTERS
DUAL ELECTRICAL SERVICES TO ALL CONTROL PANELS
INDEPENDENT ALARM CIRCUITRY REQUIRED

NOTICE:
THE TANKS MAY REQUIRE CONCRETE BALLAST TO PREVENT FLOTATION

THE CONTRACTOR SHALL NOTIFY ENGINEER OF THE SEPTIC TANK SELECTION AND PROVIDE CUT SHEETS WITH ESTIMATED TANK WEIGHT. THE ENGINEER WILL CALCULATE THE REQUIRED CONCRETE BALLAST BASED ON TANK WEIGHT AND BURY DEPTH.

NO DEVIATIONS FROM THIS PLAN WILL BE ALLOWED WITHOUT ENGINEERS AUTHORIZATION IN WRITING THE ENTIRE DRAIN LINE, TANKS, CONNECTIONS AND RISERS WILL BE REQUIRED TO BE WATER TIGHT
24 HOUR MINIMUM LEAK TEST BY ENGINEER (OR INFILTRATION TEST) WILL BE REQUIRED



SYSTEM OPERATING CURVE
MYERS ME 50 EFFLUENT PUMP
1/2 HP, 230 V
NOT TO SCALE

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PRELIMINARY
DETAIL SHEET

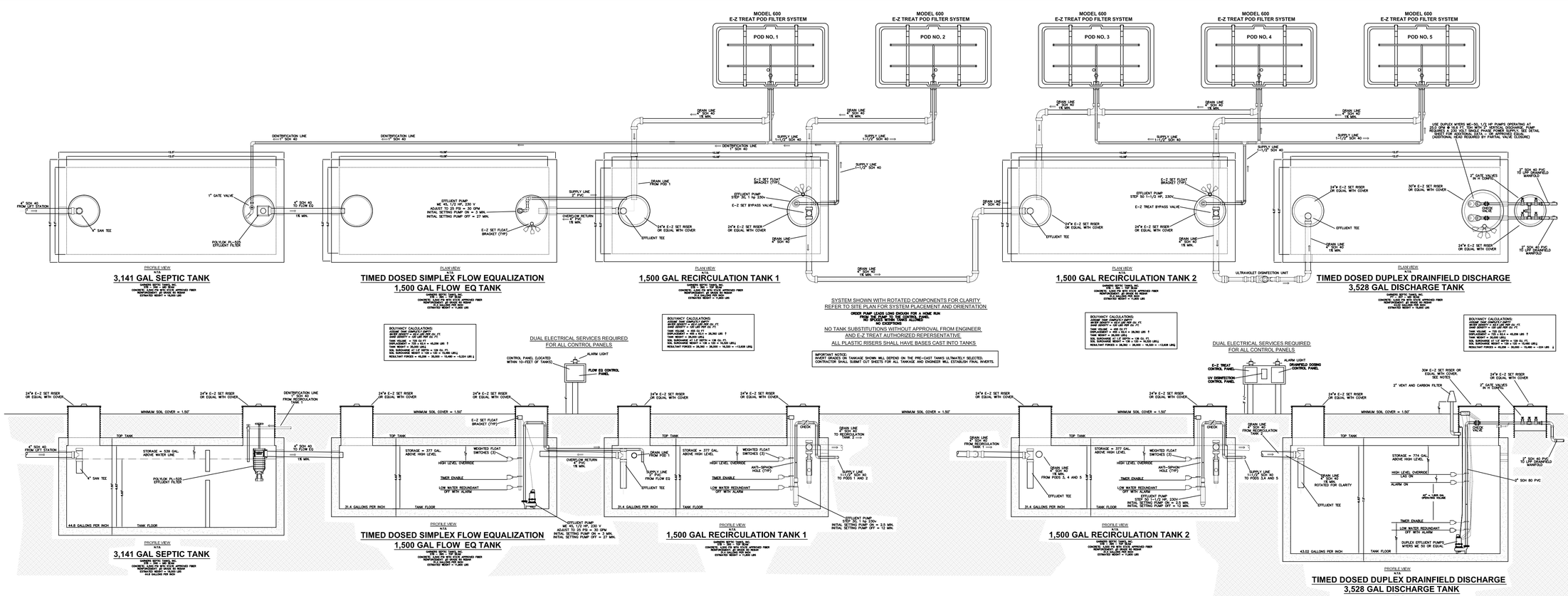
NORTH CAROLINA PROFESSIONAL SEAL 18994 ENGINEER MICHAEL W. ROBINSON

REVISIONS

NO.	DATE	DESCRIPTION	BY

PROJECT:
ANCHOR COMMERCIAL LLC
MANNS HARBOR DARE COUNTY/MANTEO NORTH CAROLINA
SHIPYARD ROAD RESIDENTIAL DEVELOPMENT

DATE: 04-03-23
SCALE: 1" = 20'
DESIGNED: MWR
DRAWN: MWR
SHEET: 5 OF 6
CAD FILE:
PROJECT NO: 010823-1



EZ-TREAT MODEL 2,990 GPD WASTEWATER TREATMENT INCLUDING FIVE MODEL 600 PODS AND FLOW EQUALIZATION DESIGN FLOW = 2,990 GPD

TREATMENT LEVEL: TS-II WITH UV DISINFECTION.
REFERENCE INNOVATIVE WASTEWATER SYSTEM NO: IWWS 2015-03-R2

NOTICE:
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24 HOUR MINIMUM LEAK TEST BY ENGINEER (OR INFILTRATION TEST) WILL BE REQUIRED

WASTEWATER SYSTEM CONTRACTOR MUST BE APPROVED BY EZ-TREAT
NO MATERIAL SUBSTITUTIONS ALLOWED WITHOUT PRIOR WRITTEN APPROVAL BY EZ-TREAT COMPANY AND ENGINEER

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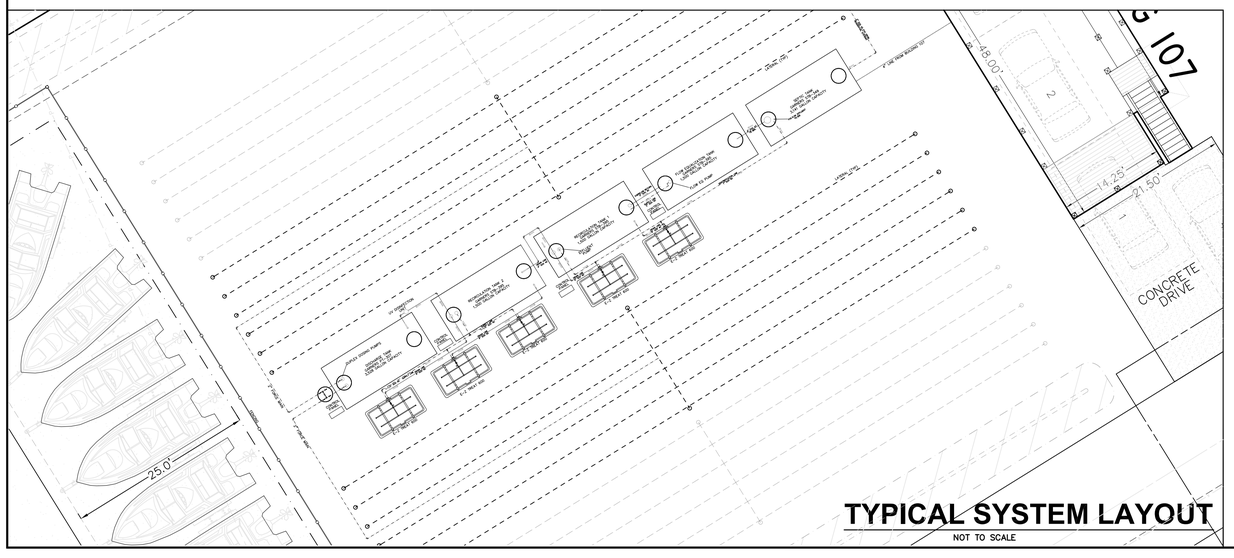

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18994 MICHAEL W. ROBINSON

NO.	DATE	DESCRIPTION	BY
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PROJECT:
ANCHOR COMMERCIAL LLC
MANNS HARBOR DARE COUNTY/MANTEO NORTH CAROLINA
SHIPYARD ROAD RESIDENTIAL DEVELOPMENT

DATE: 04-03-23
SCALE: 1" = 20'
DESIGNED: MWR
DRAWN: MWR
SHEET: 6 OF 6
CAD FILE:
PROJECT NO: 010823-1

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18994 MICHAEL W. ROBINSON 04-02-23