



GOVERNMENT OF BERMUDA

MINISTRY OF PUBLIC WORKS

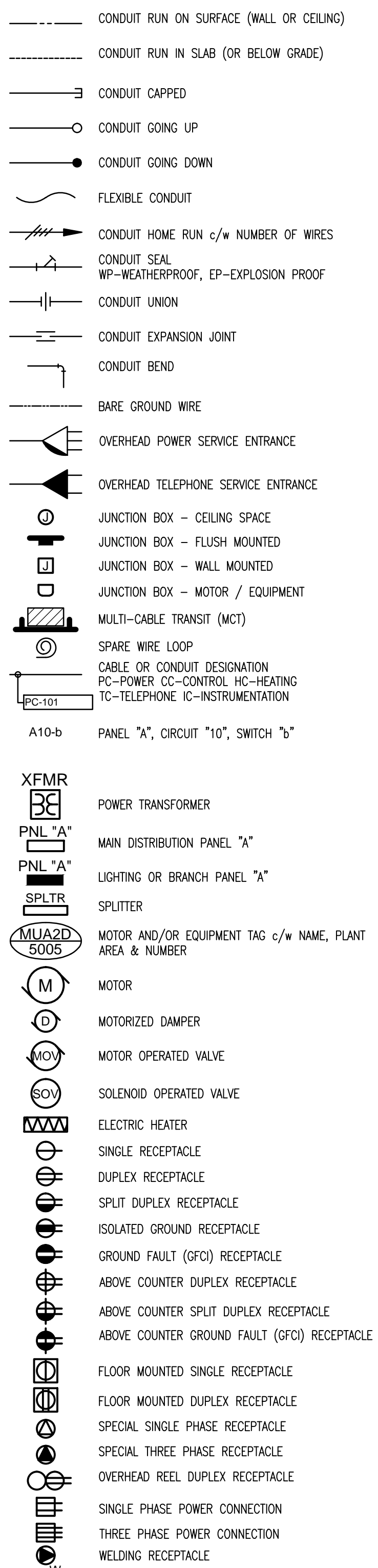
DEPARTMENT OF WORKS AND ENGINEERING

ELECTRICAL AND MECHANICAL ENGINEERING SECTION

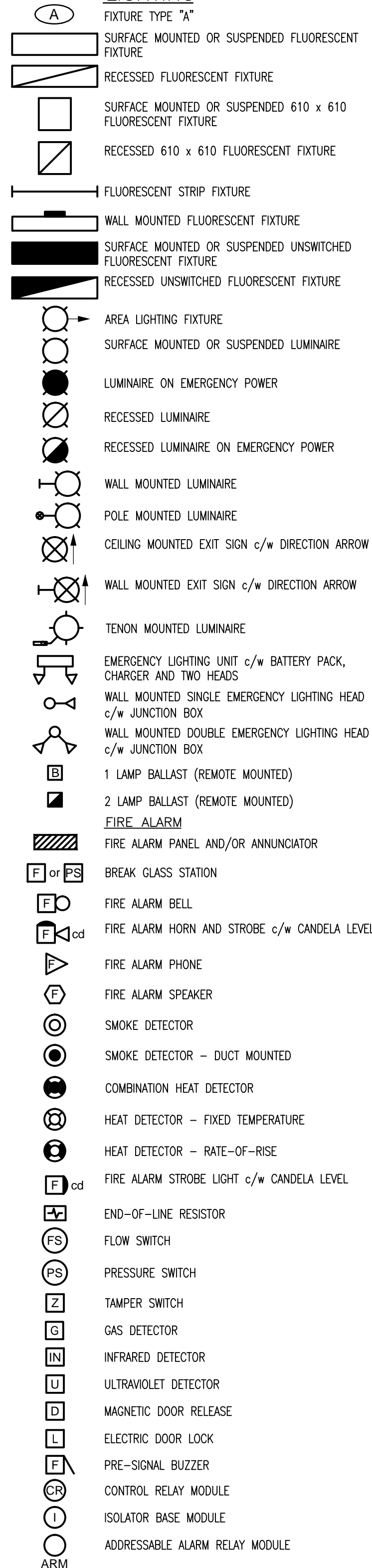
P.O. Box HM 1365 Hamilton HMFX Bermuda Tel: (441) 295-5151 Fax: (441) 295-4675

LAYOUT SYMBOLS

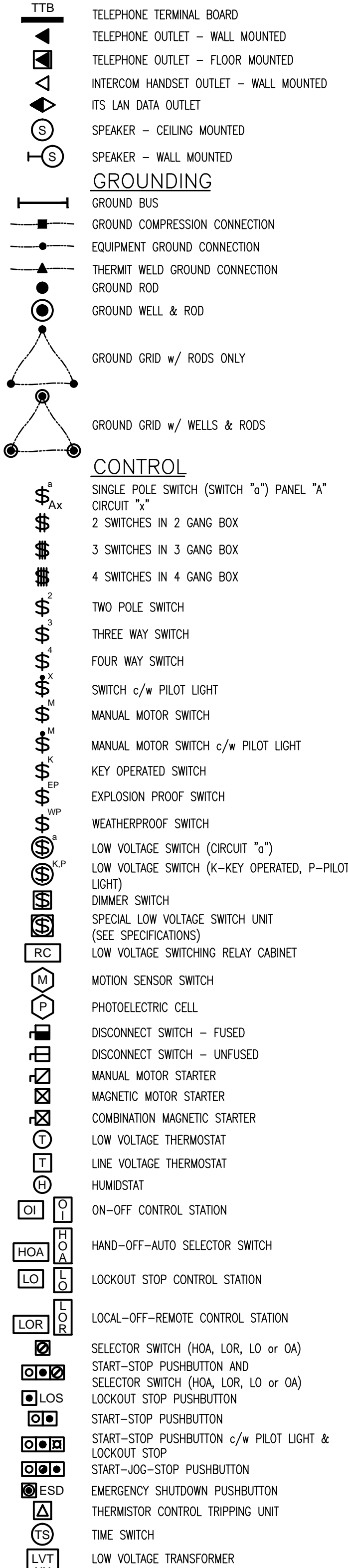
CABLE, CONDUIT & WIRE



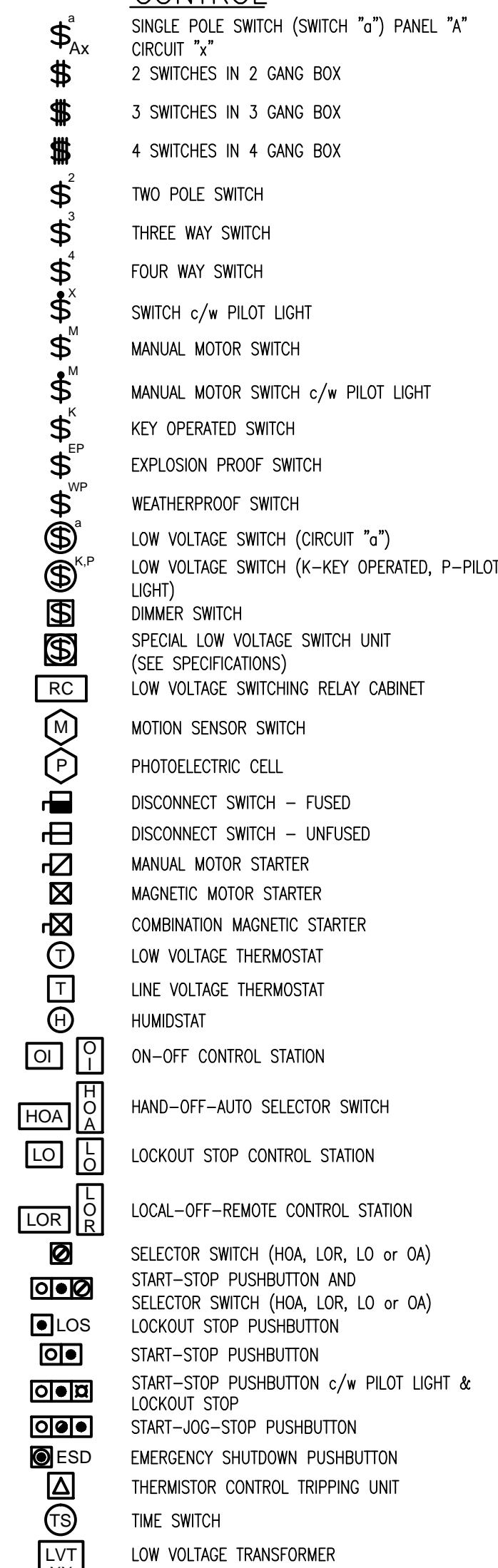
LIGHTING



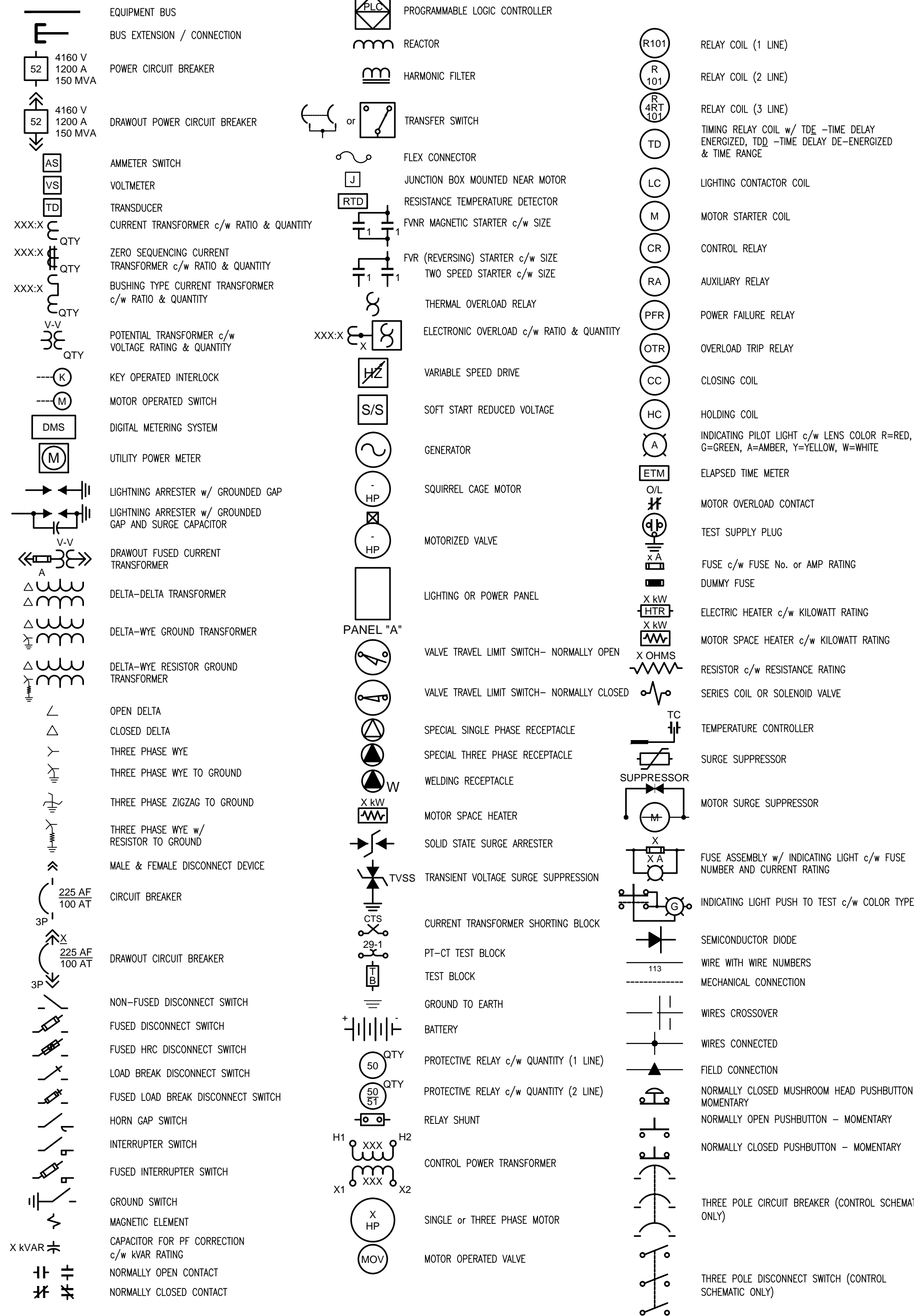
COMMUNICATIONS



CONTROL



SINGLE LINE DIAGRAM / SCHEMATIC SYMBOLS



ABBREVIATIONS

Table of abbreviations: BD - BUS DUCT, CB - CIRCUIT BREAKER, DB - DUCT BANK, DS - DISCONNECT SWITCH, MCC - MOTOR CONTROL CENTRE, PDP - POWER DISTRIBUTION PANEL, PNL - BRANCH PANEL BOARD, SWB - SWITCHBOARD, T - TRANSFORMER, UPS - UNINTERRUPTIBLE POWER SUPPLY

NOTES:

THIS DRAWING IS GENERAL IN NATURE. NOT ALL SYMBOLS, ABBREVIATIONS ARE USED IN THESE CONTRACT DRAWINGS.

ISSUE / REVISION

Table with columns for No., Date, and description of revisions. Includes entries for 'ISSUED TO BLDG CONTROL' and 'ISSUED TO PLANNING'.

SCALE: -

SURVEY

Table for survey information: Prepared By, Date.

DESIGN

Table for design information: Prepared By, Date.

Checked By:

Table for checked by information: Checked By, Date.

DRAWING

Table for drawing information: Prepared By, Date.

Checked By:

Table for checked by information: Checked By, Date.

Approved By:

Table for approved by information: Approved By, Date.

Project Number:

Table for project number information: Project Number.

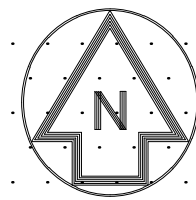
Project Title:

BEAST SEPTAGE RECEIVING STATION

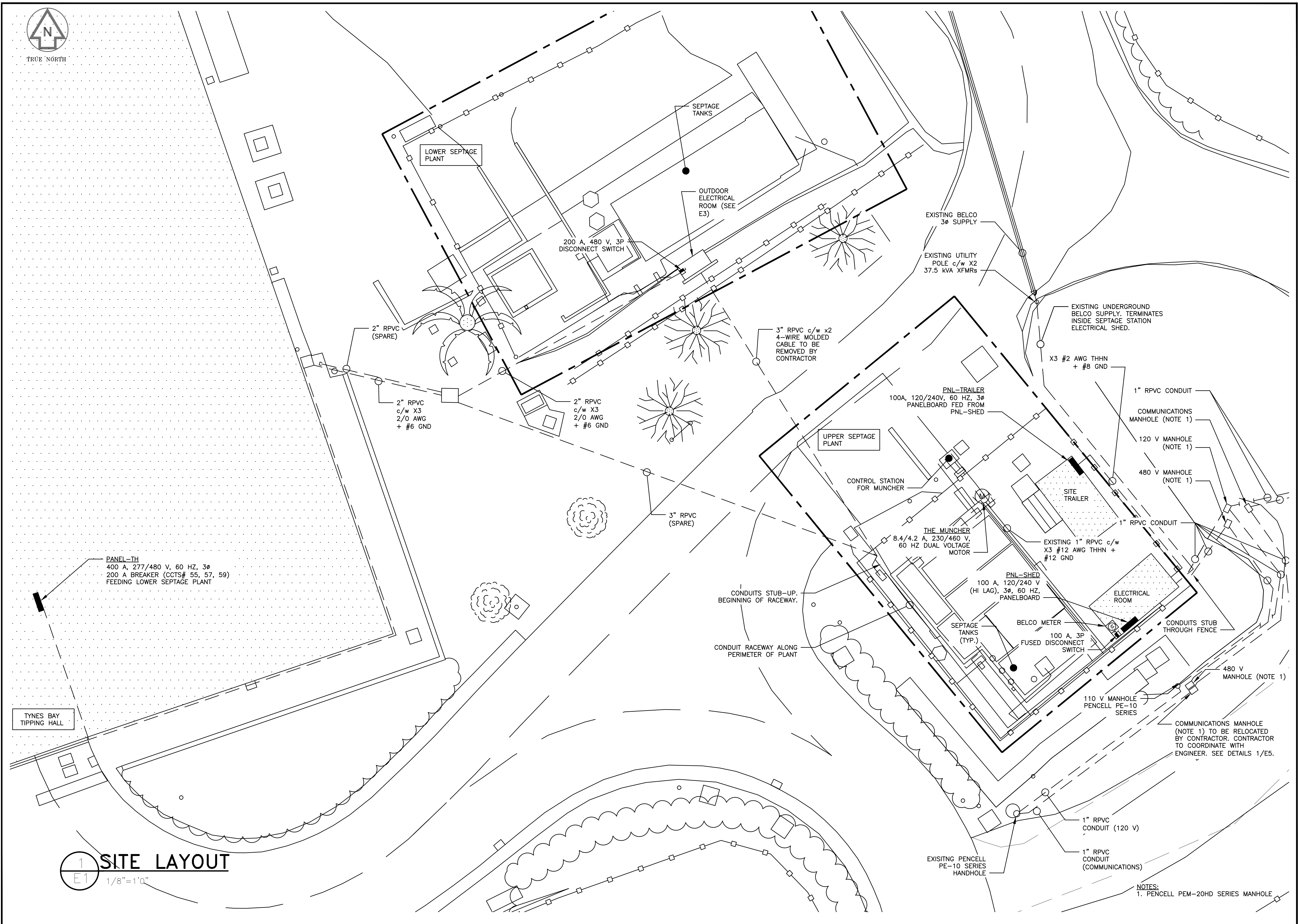
TYNES BAY WTE PLANT 31 PALMETTO ROAD DEVONSHIRE

Sheet Title:

LEGEND OF SYMBOLS



TRUE NORTH



**1 SITE LAYOUT**  
 E1 1/8"=1'0"

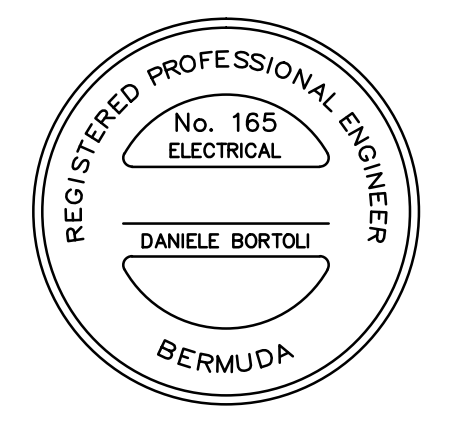


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 ENGINEERING SECTION**  
 P.O. Box HM 1365 Hamilton HMF Bermuda  
 Tel: (441) 295-5151  
 Fax: (441) 295-4675



| ISSUE / REVISION |                        |          |
|------------------|------------------------|----------|
| No.              | Description            | Date     |
| C                | ISSUED FOR TENDER      | SEP 2015 |
| B                | ISSUED TO BLDG CONTROL | AUG 2015 |
| A                | ISSUED TO PLANNING     | MAY 2015 |

| SURVEY       |           |                |
|--------------|-----------|----------------|
| Prepared By: | SM        | Date: DEC 2014 |
| DESIGN       |           |                |
| Prepared By: | DB        | Date: JAN 2015 |
| Checked By:  | DB/DB/RBS | Date: JAN 2015 |
| DRAWING      |           |                |
| Prepared By: | DB        | Date: JAN 2015 |
| Checked By:  | DB/RBS    | Date: JAN 2015 |
| Approved By: | MB        | Date: JAN 2015 |

Project Number: \_\_\_\_\_  
 Project Title:  
**BEAST SEPTAGE RECEIVING  
 STATION**

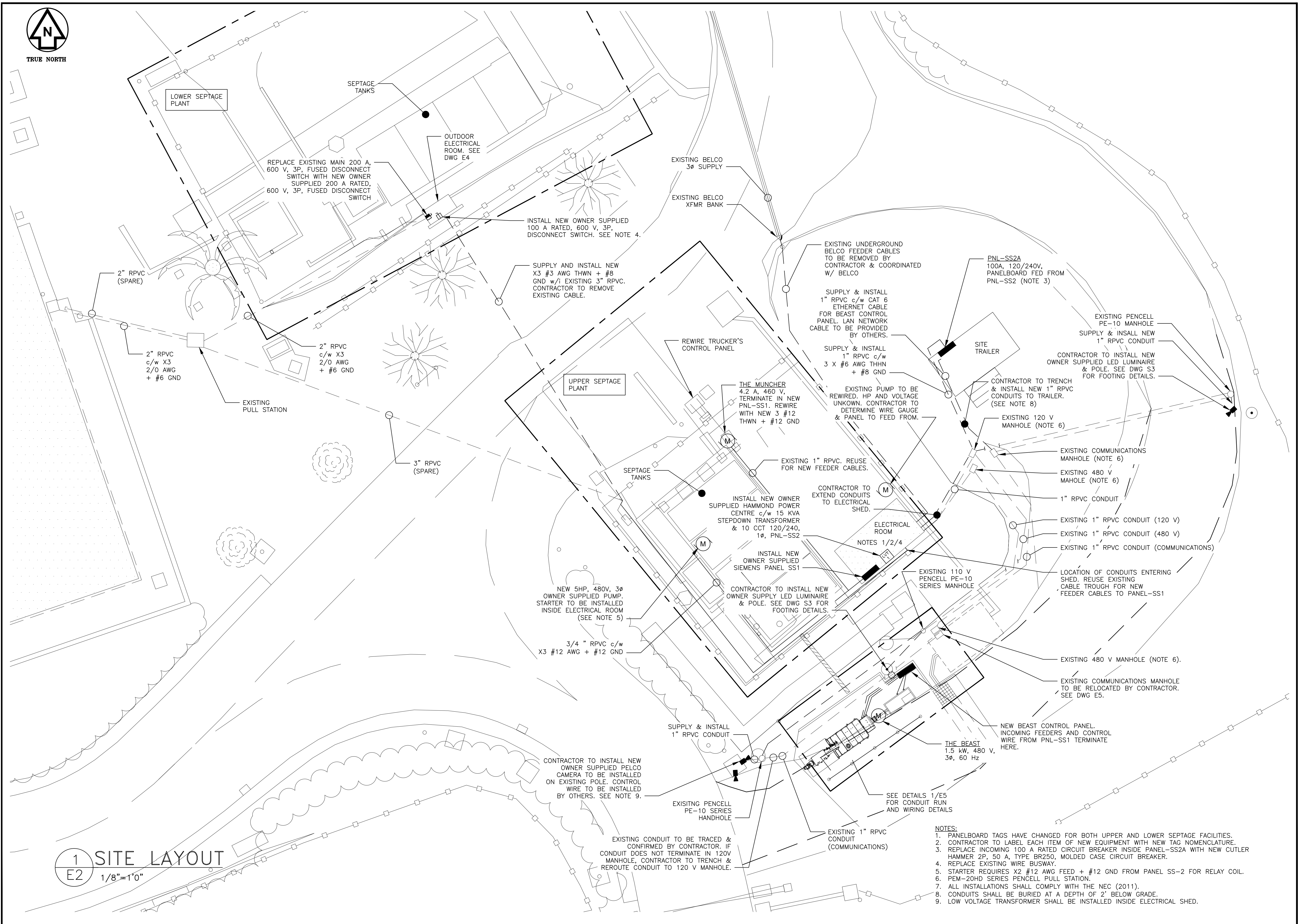
TYNES BAY WTE PLANT  
 31 PALMETTO ROAD  
 DEVONSHIRE

Sheet Title:  
**EXISTING SITE LAYOUT**





TRUE NORTH



1 SITE LAYOUT  
E2 1/8"=1'0"

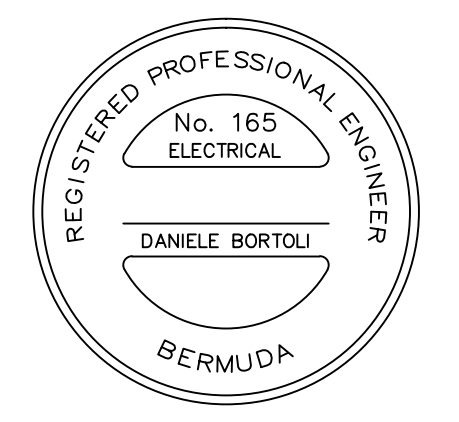


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| ISSUE / REVISION |                        |          |
|------------------|------------------------|----------|
| No.              |                        | Date:    |
| C                | ISSUED FOR TENDER      | SEP 2015 |
| B                | ISSUED TO BLDG CONTROL | AUG 2015 |
| A                | ISSUED TO PLANNING     | MAY 2015 |

SCALE: AS SHOWN

**SURVEY**  
Prepared By: SM Date: DEC 2014

**DESIGN**  
Prepared By: DB Date: JAN 2015

Checked By: DB/VDB/RBS Date: JAN 2015

**DRAWING**  
Prepared By: DB Date: JAN 2015

Checked By: DB/RBS Date: JAN 2015

Approved By: MB Date: JAN 2015

Project Number:  
Project Title:  
**BEAST SEPTAGE RECEIVING STATION**

TINES BAY WTE PLANT  
31 PALMETTO ROAD  
DEVONSHIRE

Sheet Title:  
**PROPOSED SITE LAYOUT PLAN**

Revision: Sheet Number: **E2**

- NOTES:**
- PANELBOARD TAGS HAVE CHANGED FOR BOTH UPPER AND LOWER SEPTAGE FACILITIES.
  - CONTRACTOR TO LABEL EACH ITEM OF NEW EQUIPMENT WITH NEW TAG NOMENCLATURE.
  - REPLACE INCOMING 100 A RATED CIRCUIT BREAKER INSIDE PANEL-SS2A WITH NEW CUTLER HAMMER 2P, 50 A, TYPE BR250, MOLDED CASE CIRCUIT BREAKER.
  - REPLACE EXISTING WIRE BUSWAY.
  - STARTER REQUIRES X2 #12 AWG FEED + #12 GND FROM PANEL SS-2 FOR RELAY COIL.
  - PEM-20HD SERIES PENCELL PULL STATION.
  - ALL INSTALLATIONS SHALL COMPLY WITH THE NEC (2011).
  - CONDUITS SHALL BE BURIED AT A DEPTH OF 2' BELOW GRADE.
  - LOW VOLTAGE TRANSFORMER SHALL BE INSTALLED INSIDE ELECTRICAL SHED.



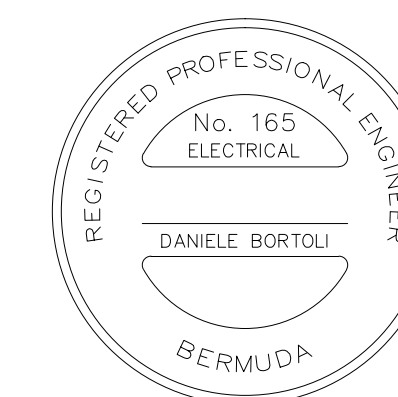
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ISSUE / REVISION

| No. | Date:                             |
|-----|-----------------------------------|
| C   | ISSUED FOR TENDER SEP 2015        |
| B   | ISSUED TO BUILDING CNTRL AUG 2015 |
| A   | ISSUED TO PLANNING MAY 2015       |

SCALE: AS SHOWN

**SURVEY**  
Prepared By: DB Date: DEC 2014

**DESIGN**  
Prepared By: DB Date: JAN 2015

Checked By: DB/DB/RBS Date: JAN 2015

**DRAWING**  
Prepared By: DB Date: JAN 2015

Checked By: DB/RBS Date: JAN 2015

Approved By: MB Date: JAN 2015

Project Number:

Project Title:

**BEAST SEPTAGE RECEIVING STATION**

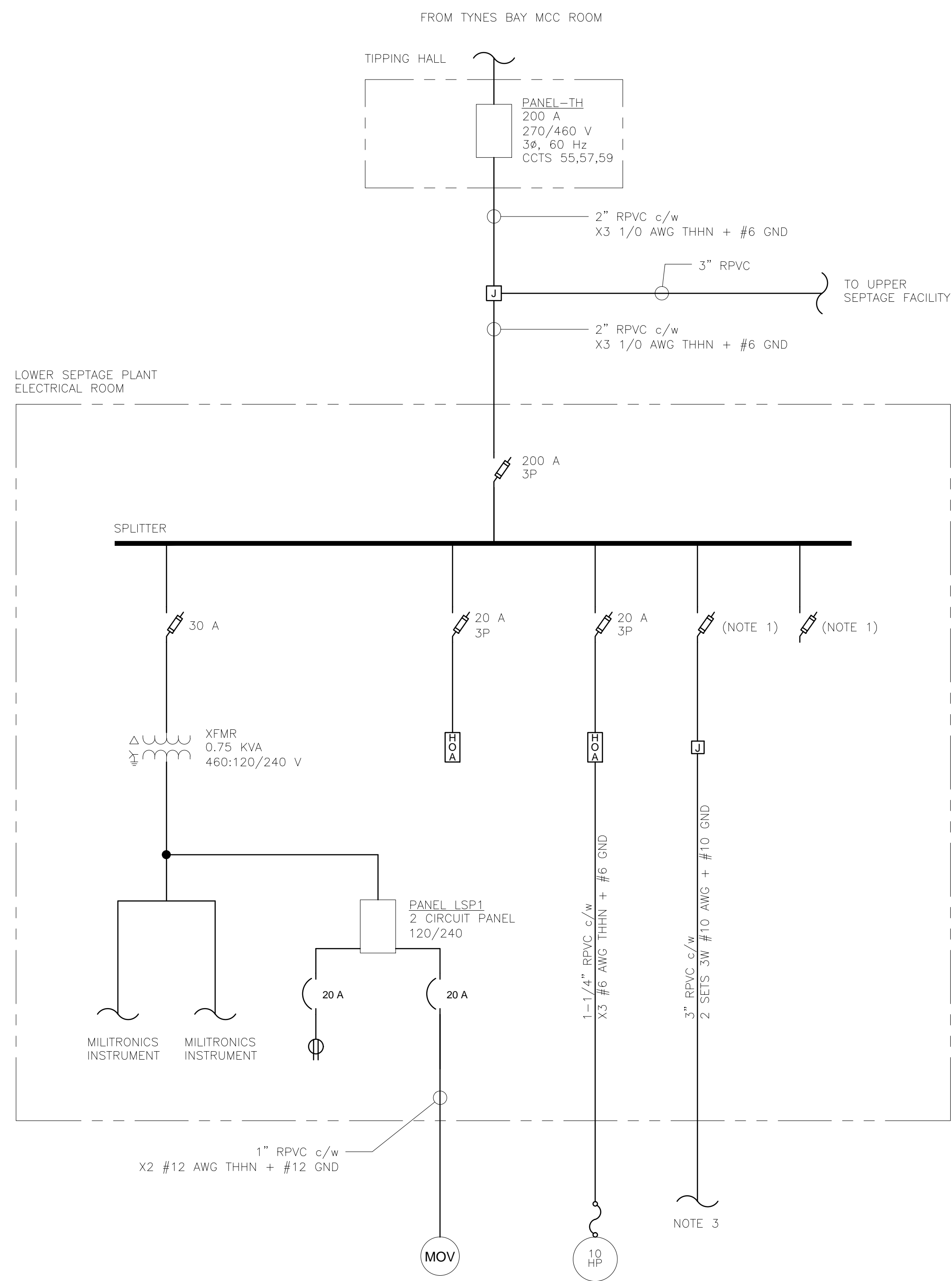
TYNES BAY WTE PLANT  
31 PALMETTO ROAD  
DEVONSHIRE

Sheet Title:

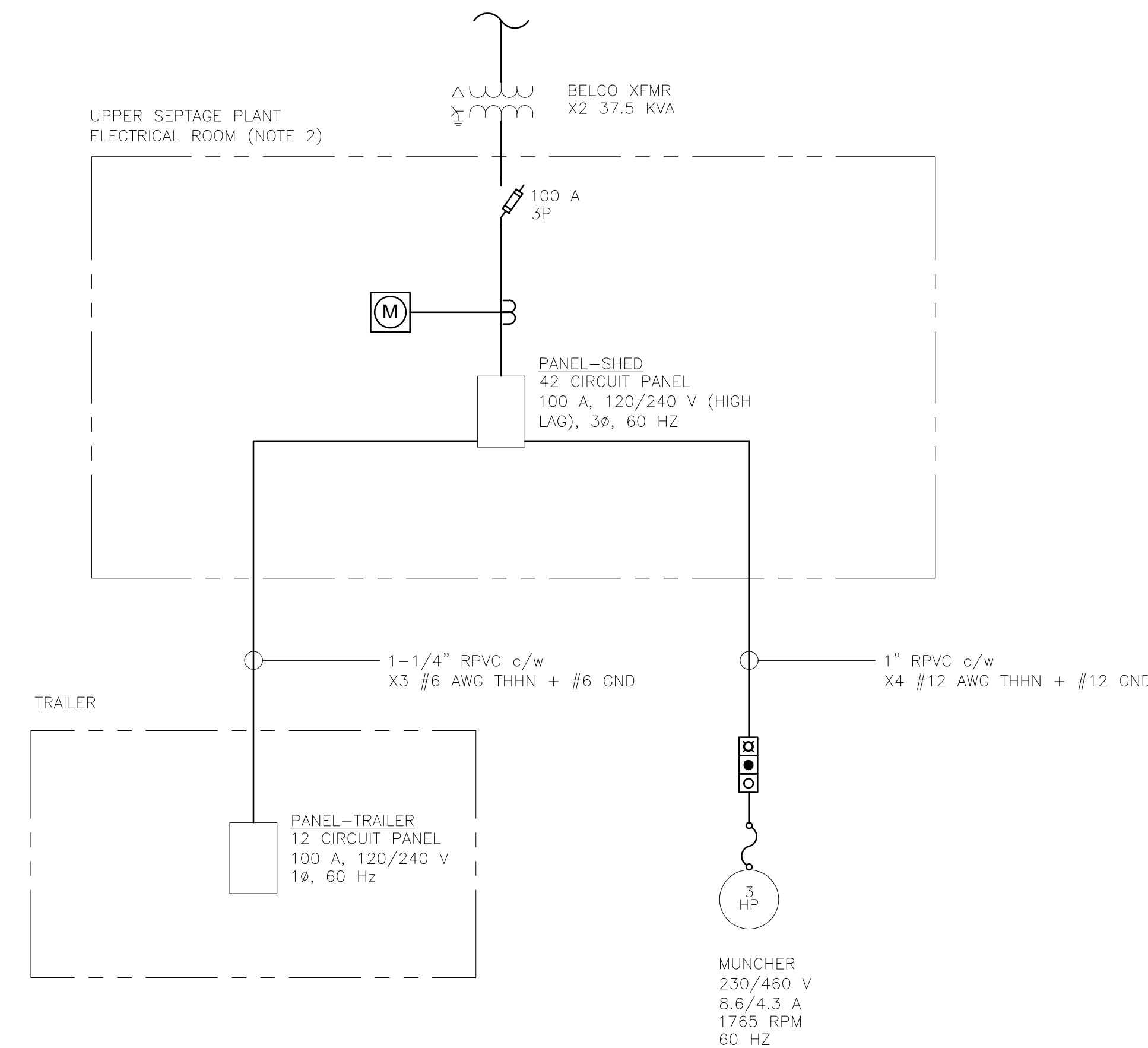
**EXISTING SINGLE LINE DIAGRAM**

Revision: Sheet Number:

**E3**



**1 LOWER SEPTAGE PLANT**  
E3 N.T.S.



- NOTES:
1. NO FUSE PRESENT AT TIME OF SURVEY (OPEN CIRCUIT).
  2. SQUARE D DISCONNECTS (X4), FLYGT PUMP CONTROLLERS & INTEGRATED HOA'S FOR PUMPS 1-6 ARE NO LONGER OPERABLE & ARE TO BE STRIPPED OUT ALONG W/ ALL COMPONENTS IN THE UPGRADE. THEY ARE NOT SHOWN ABOVE FOR SIMPLICITY.
  3. TERMINATES INSIDE THE SEPTAGE SHED IN UPPER SEPTAGE FACILITY.

**2 UPPER SEPTAGE PLANT**  
E3 N.T.S.



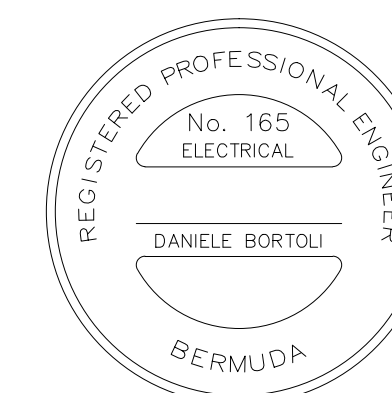
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Fax: (441) 295-4675



ISSUE / REVISION

| No. | Date:                             |
|-----|-----------------------------------|
| D   | ISSUED FOR TENDER SEP 2015        |
| C   | ISSUED TO BUILDING CNTRL AUG 2015 |
| B   | ISSUED TO PLANNING MAY 2015       |
| A   | ISSUED FOR REVIEW FEB 2015        |

SCALE: AS SHOWN

**SURVEY**  
Prepared By: DB Date: DEC 2014

**DESIGN**  
Prepared By: DB Date: JAN 2015

Checked By: DB/VDB/RBS Date: JAN 2015

**DRAWING**  
Prepared By: DB Date: JAN 2015  
Checked By: DB/RBS Date: JAN 2015

Approved By: MB Date: JAN 2015

Project Number:

Project Title:

BEAST SEPTAGE RECEIVING STATION

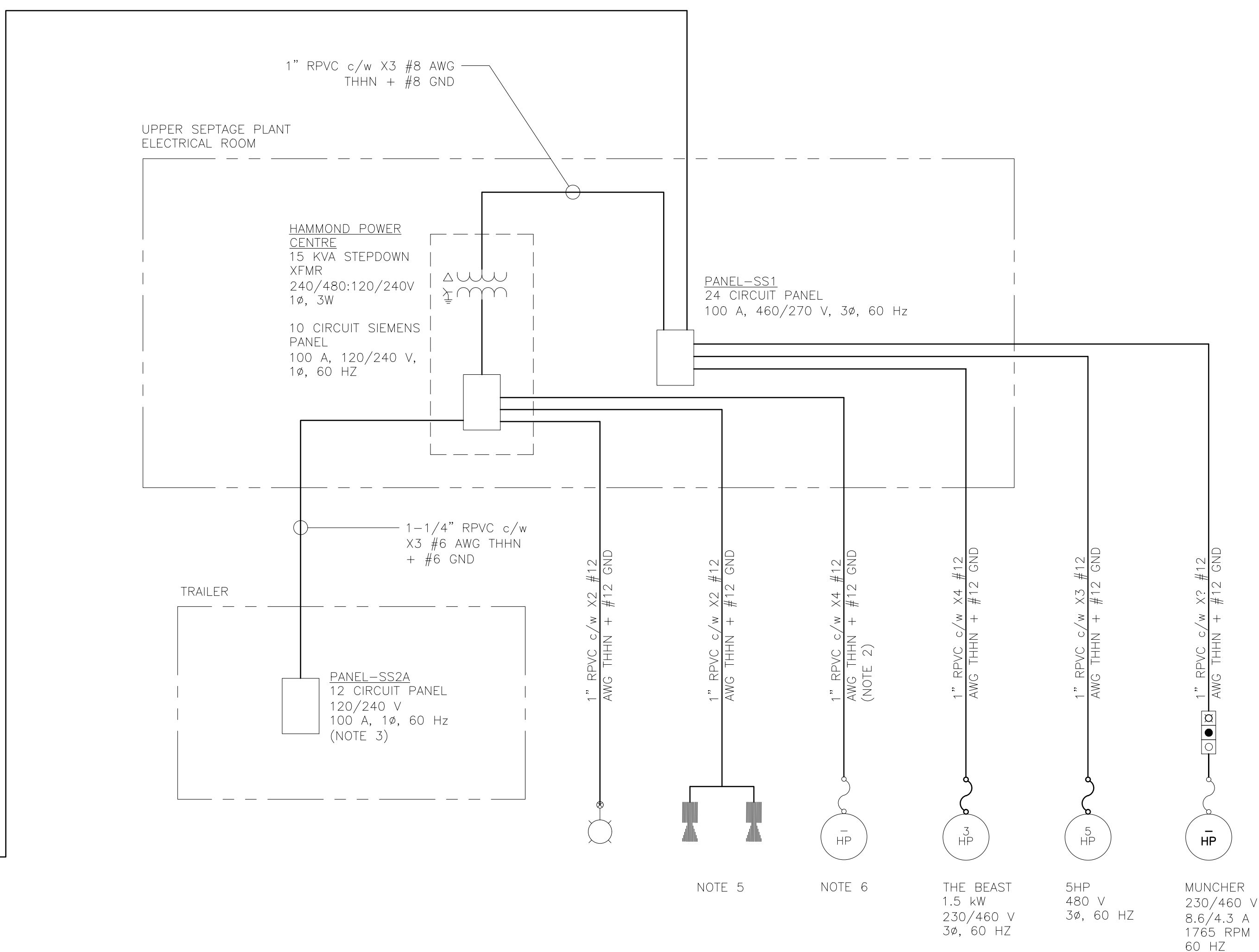
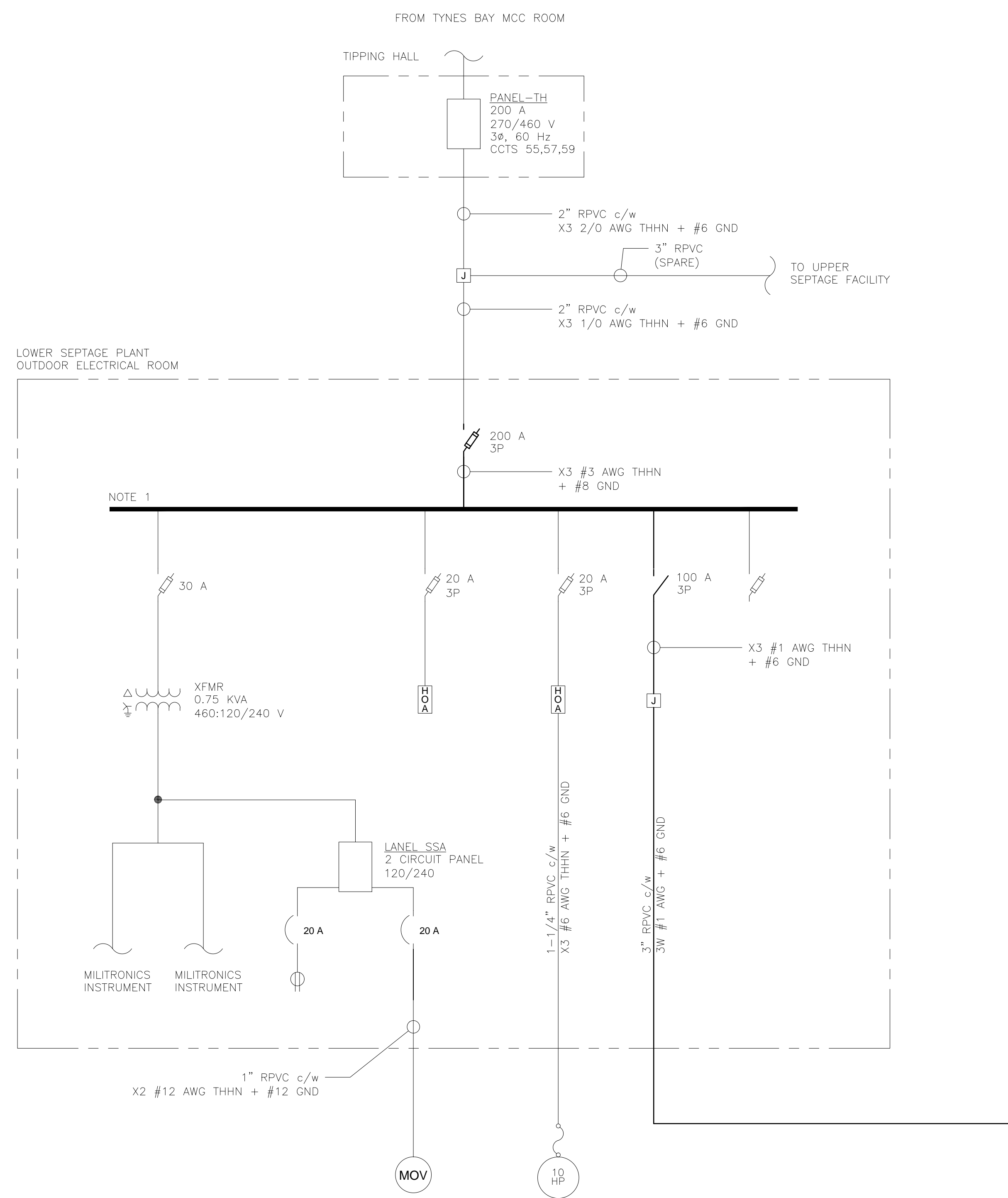
TYNES BAY WTE PLANT  
31 PALMETTO ROAD  
DEVONSHIRE

Sheet Title:

PROPOSED SINGLE LINE DIAGRAM

Revision: Sheet Number:

E4



DRAWING NOTES:

- CONDUCTORS TERMINATE INTO 3-PHASE SPLITTER. BRANCH CIRCUIT ARE TAPPED FROM THIS POINT.
- REUSE EXISTING CONDUIT, REWIRE AS NOTED.
- INSTALL NEW 50 A, 2P, TYPE BR250 CUTLER HAMMER CIRCUIT BREAKER IN PLACE OF EXISTING 100 A, 2P, MAIN CIRCUIT BREAKER.
- UNFUSED DISCONNECT SWITCH SHALL BE RATED FOR MINIMUM 100 A, 30, 60 HZ SUPPLY.
- LOW VOLTAGE TRANSFORMER FOR CCTV CAMERAS TO BE INSTALLED INSIDE ELECTRICAL SHED.
- MOTOR ASSUMED TO BE SINGLE PHASE 120 V. CONTRACTOR TO DETERMINE UTILIZATION CHARACTERISTICS AND INFORM THE ENGINEER.

GENERAL NOTES:

- GREYED DRAWING AND SYMBOLS DENOTE EXISTING EQUIPMENT WHICH IS TO REMAIN.



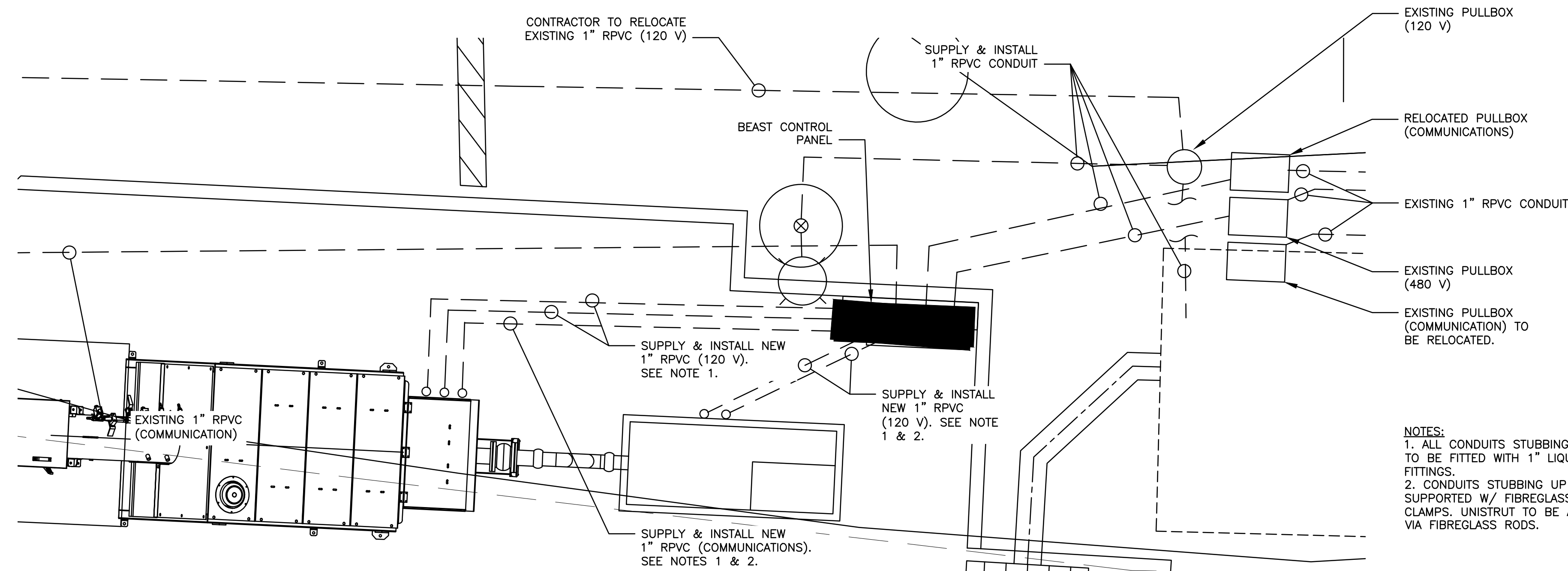
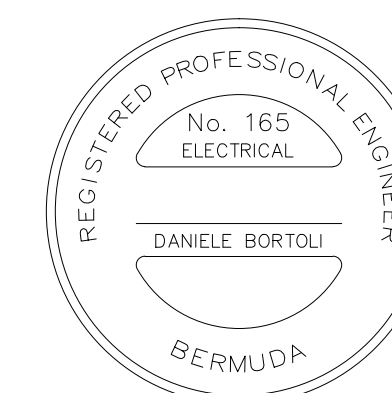
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NOTES:  
1. ALL CONDUITS STUBBING UP THROUGH SLAB ARE TO BE FITTED WITH 1" LIQUID TIGHT CONDUIT AND FITTINGS.  
2. CONDUITS STUBBING UP TO FEED BEAST TO BE SUPPORTED W/ FIBREGLASS UNISTRUT, FIBREGLASS CLAMPS. UNISTRUT TO BE ANCHORED INTO SLAB VIA FIBREGLASS RODS.

1 DETAILS  
E5 1/2"=1'0"

PANEL "SS1" SCHEDULE

LOCATION: ELECTRICAL SHED    VOLTAGE: 277/480 V    PHASE: 3    WIRE: 3  
MOUNTING: SURFACE    BUS RATING: 100 A  
INCOMING LUGS: NO    MAIN BREAKER: #3 AWG  
MANUFACTURER: SIEMENS    FEEDER: #3 AWG

| CCT No. | DESCRIPTION          | WATTAGE | BKR AMPS | BUS A | BUS B | BUS C | BKR AMPS | WATTAGE | DESCRIPTION | CCT No. |
|---------|----------------------|---------|----------|-------|-------|-------|----------|---------|-------------|---------|
| 1       | HAMMOND POWER CENTRE | 9600    | 40       | A     |       |       | 15       | 1216    | 5 HP MOTOR  | 2       |
| 3       |                      | 9600    | 2P       |       | B     |       |          | 1216    |             | 4       |
| 5       | SPARE                |         | 15       |       |       | C     | 3P       | 1216    |             | 6       |
| 7       | THE BEAST (MOTOR)    | 4032    | 15       | A     |       |       | 15       |         | SPARE       | 8       |
| 9       |                      | 4032    |          |       | B     |       | 15       |         | SPARE       | 10      |
| 11      |                      | 4032    | 3P       |       |       | C     | 15       |         | SPARE       | 12      |
| 13      | MUNCHER              | 768     | 15       | A     |       |       |          |         | SPACE       | 14      |
| 15      |                      | 768     |          |       | B     |       |          |         | SPACE       | 16      |
| 17      |                      | 768     | 3P       |       |       | C     |          |         | SPACE       | 18      |
| 19      | SPACE                |         |          | A     |       |       |          |         | SPACE       | 20      |
| 21      | SPACE                |         |          |       | B     |       |          |         | SPACE       | 22      |
| 23      | SPACE                | 14400   |          |       |       | C     |          |         | SPACE       | 24      |
|         |                      | 14400   |          |       |       |       |          | 1216    | 1216        | 1216    |

NOTES:  
1. PANEL SCHEDULE TO BE PREPARED BY CONTRACTOR  
2. X    PHASE A TOTAL - 15616 W  
3. X    PHASE B TOTAL - 15616 W  
4. X    PHASE C TOTAL - 14400 W  
5. X    PANEL LOAD TOTAL - 45632 W

PANEL "SS2" SCHEDULE

LOCATION: ELECTRICAL SHED    BUS RATING: 120/240 V  
MOUNTING: RECESSED    MAIN BREAKER: YES  
INCOMING LUGS: NO    FEEDER: #4 AWG  
MANUFACTURER: SIEMENS    PHASE: 1  
VOLTAGE: 120/240 V    WIRE: 3

| CCT No. | DESCRIPTION       | WATTAGE | BKR AMPS | BUS A | BUS B | BUS C |
|---------|-------------------|---------|----------|-------|-------|-------|
| 1       | TRAILER           | 600     | 50       | A     |       |       |
| 2       |                   | 600     | 2P       |       |       | B     |
| 3       | SPARE             |         | 30       | A     |       |       |
| 4       |                   |         | 2P       |       |       | B     |
| 5       | SPARE             |         | 15       | A     |       |       |
| 6       |                   |         | 2P       |       |       | B     |
| 7       | CCTV              | 200     | 15       | A     |       |       |
| 8       | SPARE             |         | 15       | A     |       | B     |
| 9       | 5HP MOTOR STARTER | 600     | 15       | A     |       |       |
| 10      | MOTOR             | 1000    | 15       | A     |       | B     |

PHASE A TOTAL - 1400 W  
PHASE B TOTAL - 1600 W  
PANEL LOAD TOTAL - 3000 W

NOTES:  
1. X  
2. X  
3. X  
4. X

PANEL "SS2A" SCHEDULE

LOCATION: TRAILER    VOLTAGE: 120/240 V    PHASE: 3    WIRE: 3  
MOUNTING: RECESSED    BUS RATING: 50 A  
INCOMING LUGS: NO    MAIN BREAKER: #6 AWG  
MANUFACTURER: HAMMOND    FEEDER: #6 AWG

| CCT No. | DESCRIPTION     | WATTAGE | BKR AMPS | BUS A | BUS B | BUS C | WATTAGE | DESCRIPTION             | CCT No. |
|---------|-----------------|---------|----------|-------|-------|-------|---------|-------------------------|---------|
| 1       | MAIN DISCONNECT | 9600    | 50       | A     |       |       |         | SPACE                   | 2       |
| 3       |                 | 9600    | 2P       |       | B     |       |         | SPACE                   | 4       |
| 5       | SPACE           |         |          |       |       |       |         | SPACE                   | 6       |
| 7       | LIGHTS (NOTE 1) | 100     | 15       | A     |       |       | 500     | AC/RECEPTACLES (NOTE 1) | 8       |
| 9       | SPACE           |         |          |       | B     |       |         | NOTE 2                  | 10      |
| 11      | SPACE           |         |          |       |       |       |         | SPACE                   | 12      |

NOTES:  
1. 15A SPLIT CIRCUIT BREAKER    PHASE A TOTAL - 10200 W  
2. CONTRACTOR TO DETERMINE CIRCUIT    PHASE B TOTAL - 9600 W  
3. X    PANEL LOAD TOTAL - 19800 W  
4. X

ISSUE / REVISION

| No. | Date:                           |
|-----|---------------------------------|
| B   | ISSUED FOR TENDER SEP 2015      |
| A   | ISSUED TO BLDG CONTROL AUG 2015 |

SCALE: AS SHOWN

**SURVEY**  
Prepared By: SM    Date: DEC 2014

**DESIGN**  
Prepared By: DB    Date: JAN 2015

Checked By: DB/DB/RBS    Date: JAN 2015

**DRAWING**  
Prepared By: DB    Date: JAN 2015

Checked By: DB/RBS    Date: JAN 2015

Approved By: MB    Date: JAN 2015

Project Number: -

Project Title:  
**BEAST SEPTAGE RECEIVING STATION**

TINES BAY WTE PLANT  
31 PALMETTO ROAD  
DEVONSHIRE

Sheet Title:  
**DETAILS AND PANEL SCHEDULES**







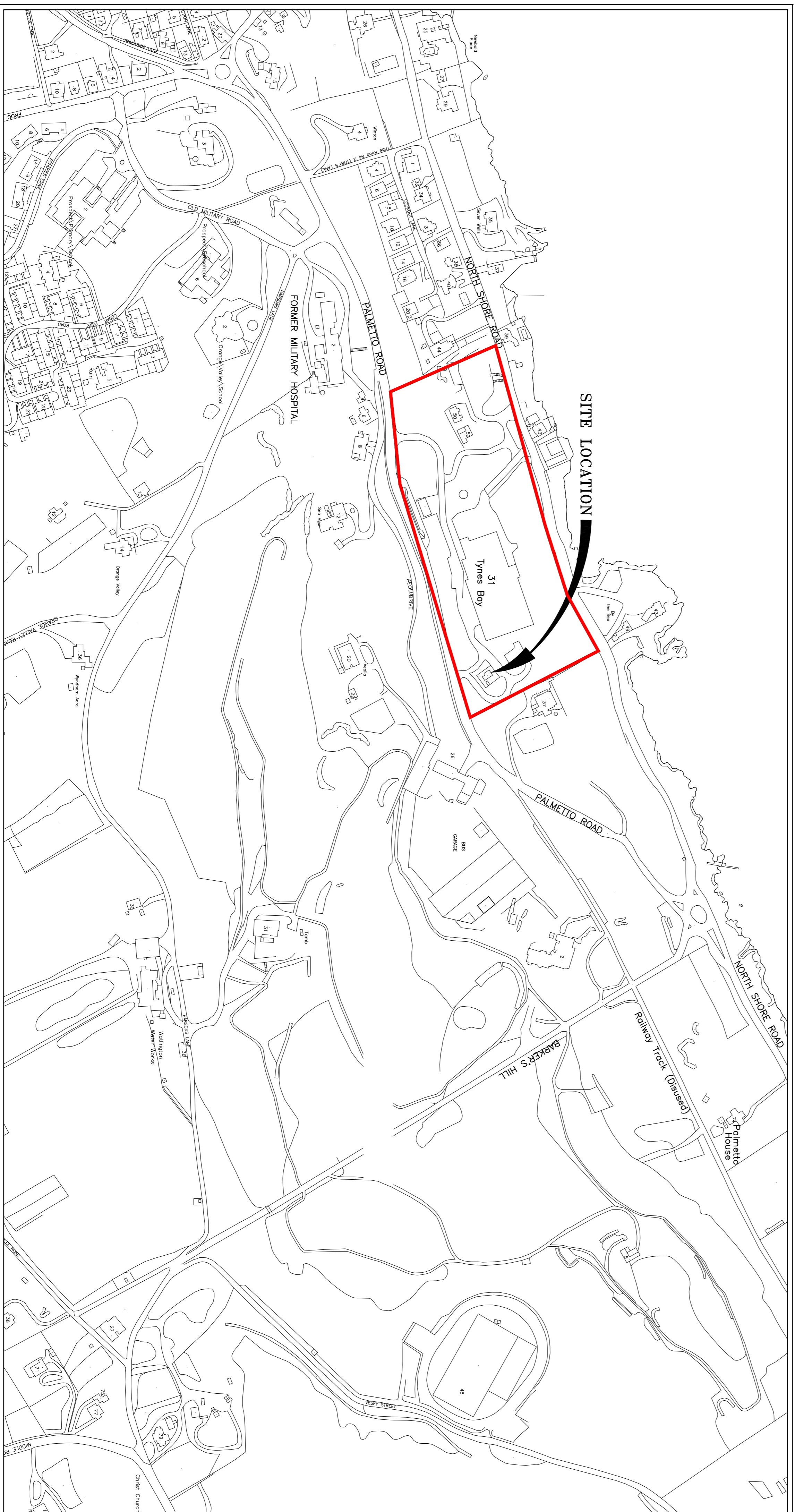




MINISTRY OF PUBLIC WORKS

TYNES BAY SEPTAGE RECEIVING STATION UPGRADES  
31 Palmetto Road, Devonshire

| DRAWING LIST |                                  |
|--------------|----------------------------------|
| 4834/005/11  | SURVEY                           |
| S1           | PROPOSED WORKS                   |
| S2           | PROPOSED SEPTAGE FACILITY LAYOUT |
| S3           | CONSTRUCTION DETAILS & NOTES     |
| E1           | LEGEND OF SYMBOLS PLAN           |
| E2           | PROPOSED LAYOUT                  |
| E3           | EXISTING SITE LAYOUT             |
| E4           | PROPOSED SITE LAYOUT PLAN        |
| E5           | EXISTING SINGLE LINE DIAGRAM     |
|              | PROPOSED SINGLE LINE DIAGRAM     |
|              | DETAILS AND PANEL SCHEDULES      |



KEY MAP

ISSUED FOR: TENDER 07/12/15

AMENDMENTS:

| NO | REVISION | BY | APP | DATE |
|----|----------|----|-----|------|
|    |          |    |     |      |
|    |          |    |     |      |
|    |          |    |     |      |
|    |          |    |     |      |
|    |          |    |     |      |

SCALE: .

SURVEY  
PREPARED BY: DATE:

DESIGN  
PREPARED BY: DATE: 10/11/15  
M. BIFFIN  
CHECKED BY: DATE: 16/02/15  
T. CHRISTOPHER

DRAWING  
PREPARED BY: DATE: 12/02/15  
T. HARMER  
CHECKED BY: DATE: 16/02/15  
M. BIFFIN  
APPROVED BY: DATE: 19/02/15  
T. CHRISTOPHER

PROJECT NUMBER:

PROJECT NAME:  
TYNE'S BAY  
SEPTAGE RECEIVING  
UPGRADES  
31 PALMETTO ROAD  
DEVONSHIRE PARISH

SHEET TITLE:  
COVER

SHEET NUMBER: S0

REVISION









*Structures Section*

ISSUED FOR: TENDER 07/12/15

| AMENDMENTS: | NO | REVISION | BY | APP | DATE |
|-------------|----|----------|----|-----|------|
|             |    |          |    |     |      |

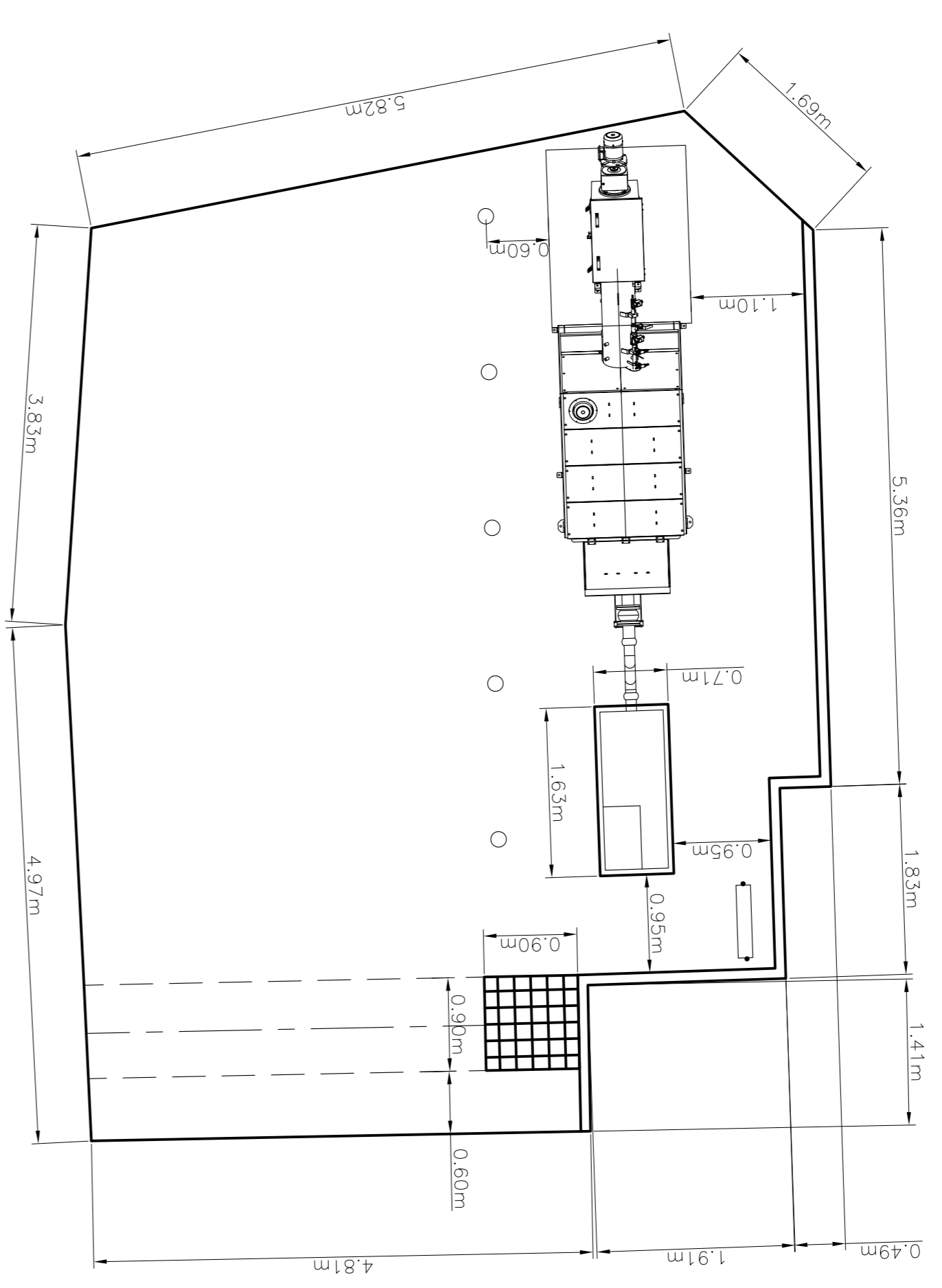
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| PREPARED BY: M. BIFFIN      | 12/02/15       |
| CHECKED BY: T. CHRISTOPHER  | 16/02/15       |
| DRAWING                     | DATE:          |
| PREPARED BY: T. HARMER      | 12/02/15       |
| CHECKED BY: M. BIFFIN       | 16/02/15       |
| APPROVED BY: T. CHRISTOPHER | DATE: 19/02/15 |

| SURVEY       | DATE: |
|--------------|-------|
| PREPARED BY: |       |

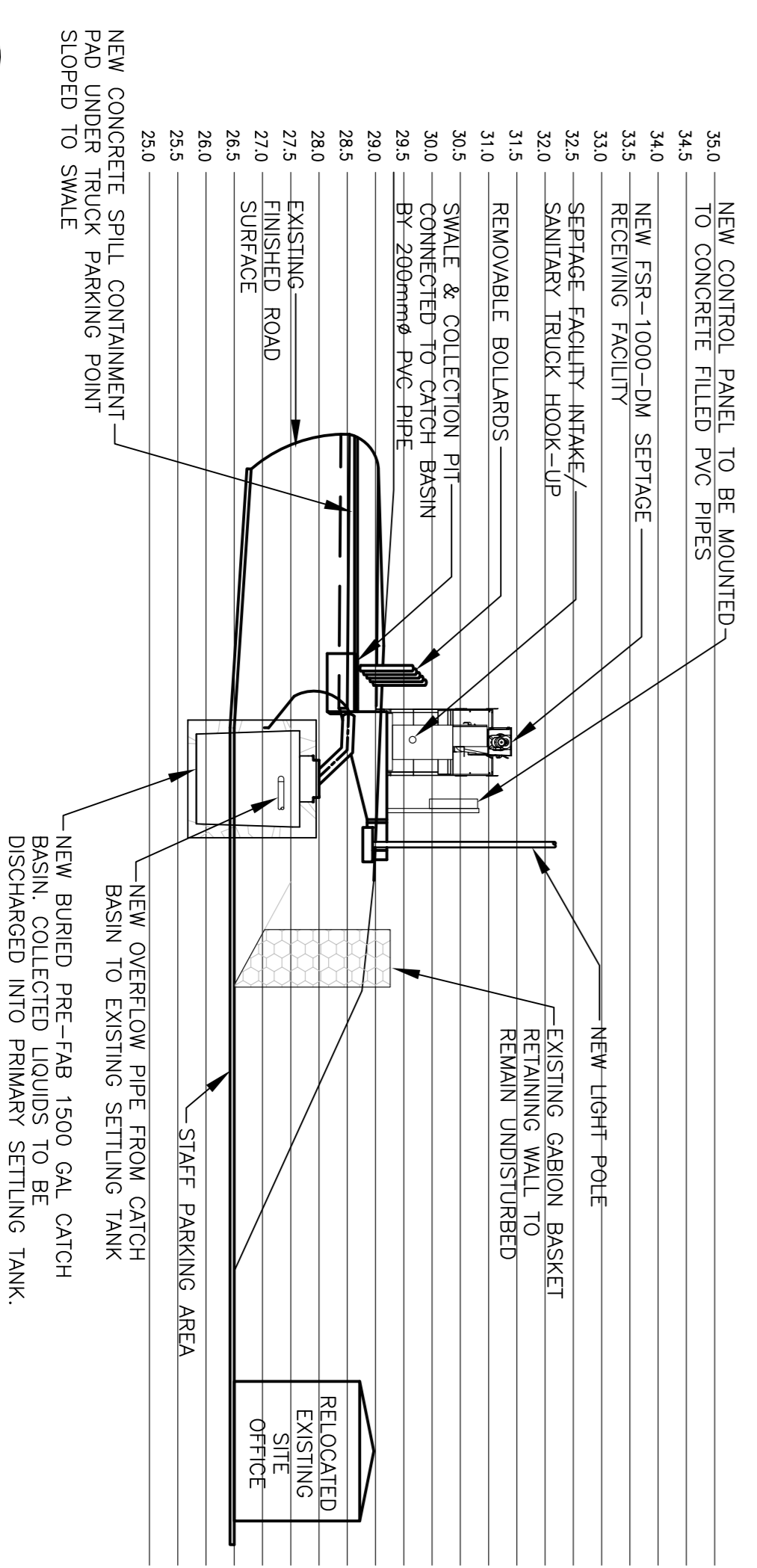
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|-----------------|---|
|                 | TYNE'S BAY<br>SEPTAGE RECEIVING<br>UPGRADES |
|                 | 31 PALMETTO ROAD<br>DEVONSHIRE PARISH       |

| SHEET NUMBER: | REVISION |
|---------------|----------|
| S2            |          |

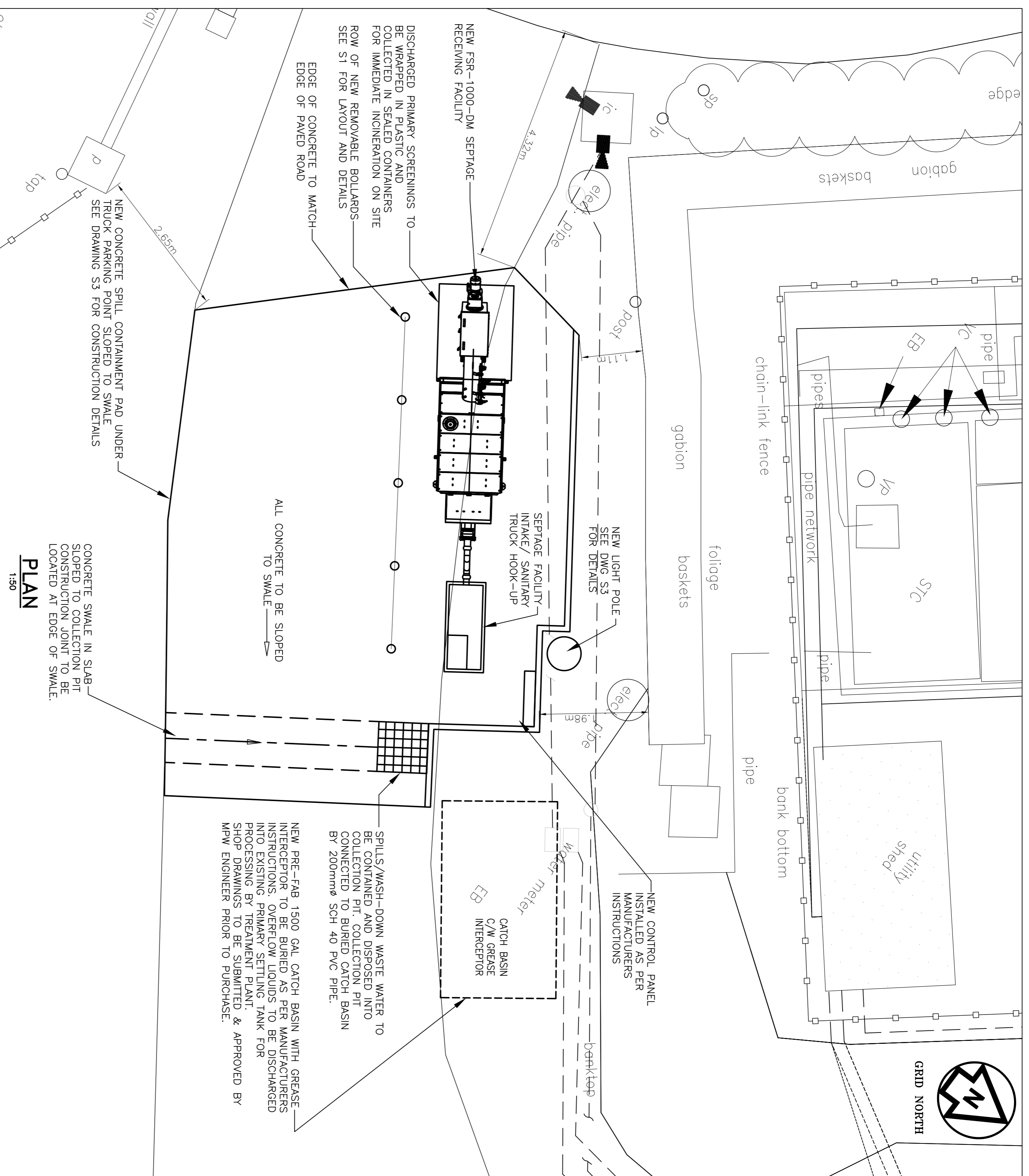
SHEET TITLE:  
**PROPOSED SEPTAGE  
FACILITY LAYOUT**



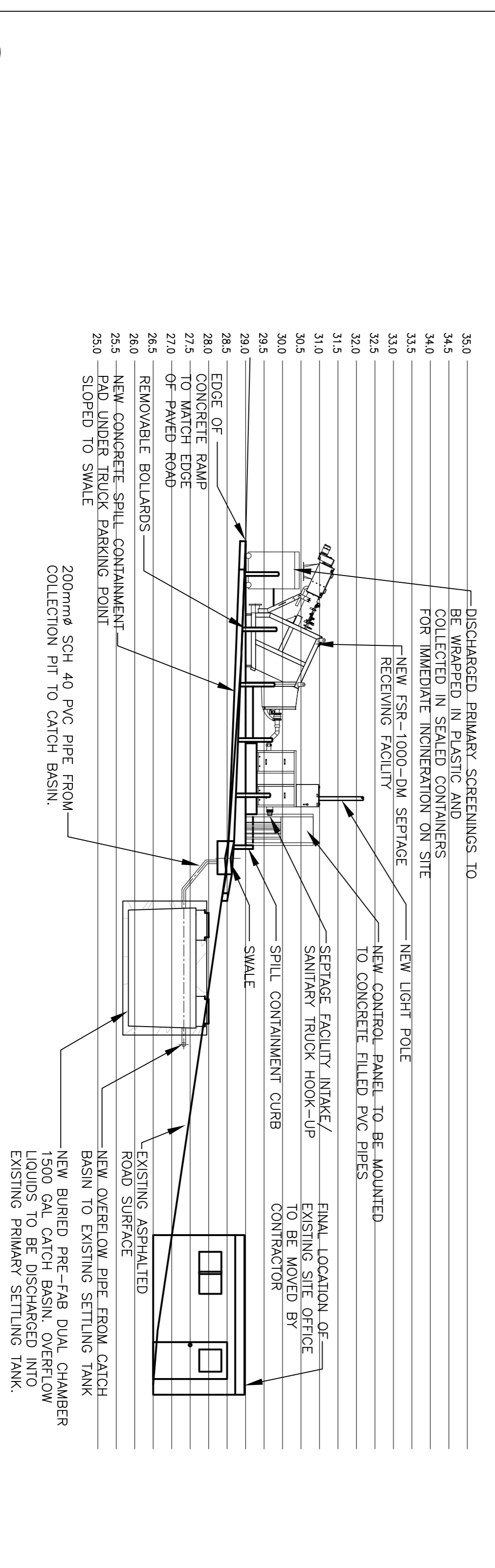
**3 CONC. PAD DIMENSIONS**  
S2 1:50



**2 SECTION B-B**  
S2 1:100



**1 PLAN**  
S2 1:50



**1 SECTION A-A**  
S2 1:100

