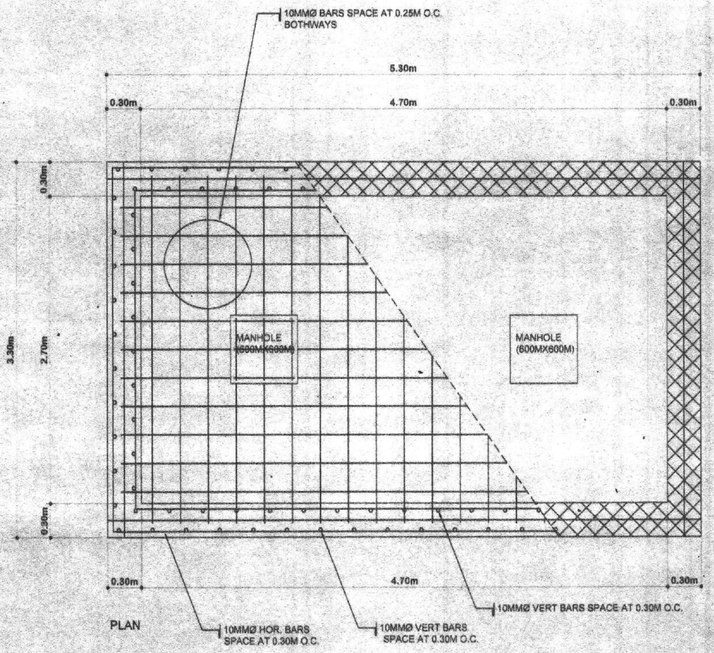
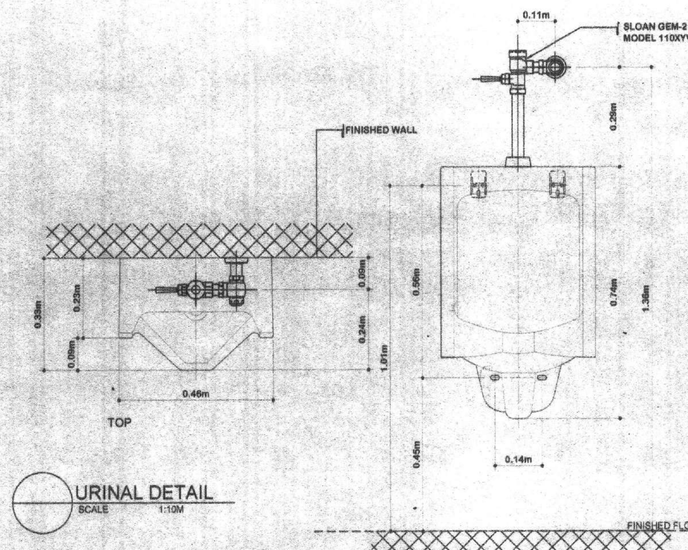
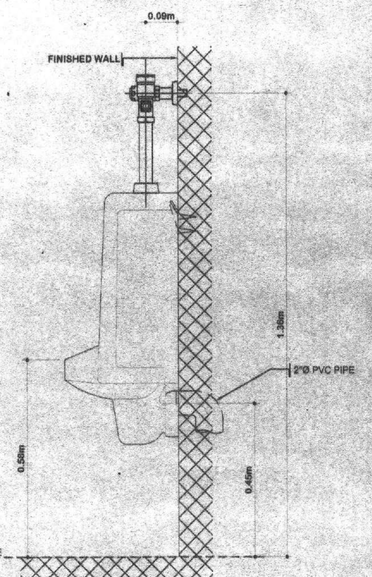


PLAN



TOP

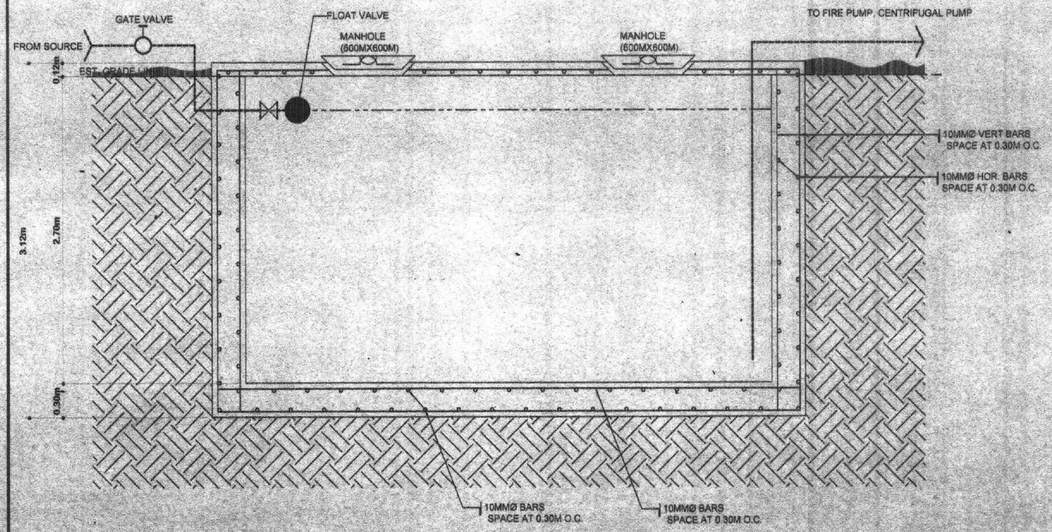
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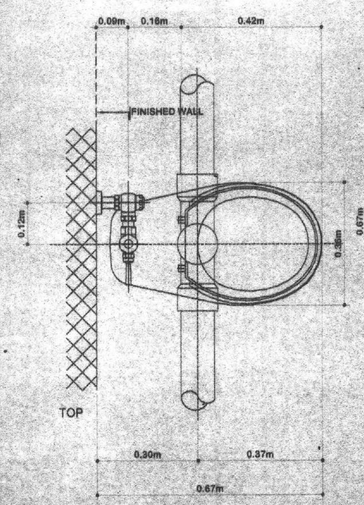
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URINAL DETAIL
SCALE 1:10M

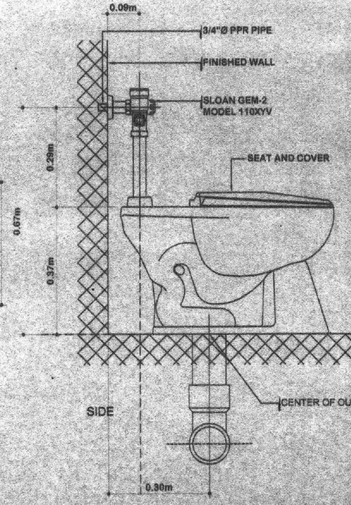
1. ALL SOIL PIPES AND WASTE PIPE SHALL BE PVC SERIES 1000 WITH BELL AND SPIGOT. JOINTS FIRMLY CAULK WITH PVC EPOXY.
2. ALL WATER SUPPLY PIPES SHALL BE POLYPROPELENE RANDOM PIPE SHED 40, WITH THREADED JOINT.
3. PROVIDE TWO (2) PERCENT SLOPE FOR SEWER LINE.
4. ALL PLUMBING MATERIALS SHALL BE FREE FROM DEFECTS.
5. ALL PUMBING WORKS SHALL BE DONE BY EXPERIENCED JOURNEYMEN PLUMBERS, UNDER THE DIRECT SUPERVISIONS OF A DULY LICENSED MASTER PLUMBER.
6. OTHER ASPECTS NOT FOUND IN THE PLAN AND SPECIFICATIONS, THE LATEST EDITION OF THE NATIONAL PLUMBING CODE OF THE PHILIPPINES OR THE R.A.1378 SHALL PREVAIL.



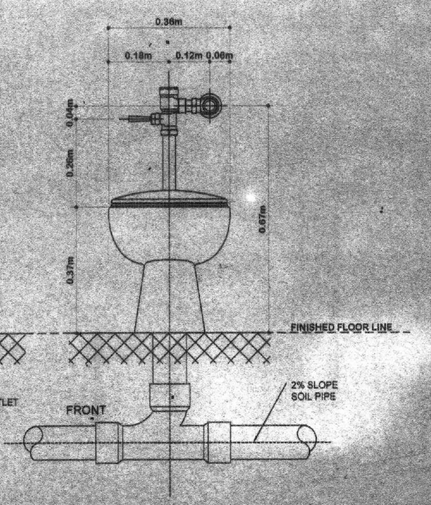
CISTERN TANK DETAIL
SCALE 1:30M



TOP



SIDE



FRONT

WATER CLOSET DETAIL
SCALE 1:10M

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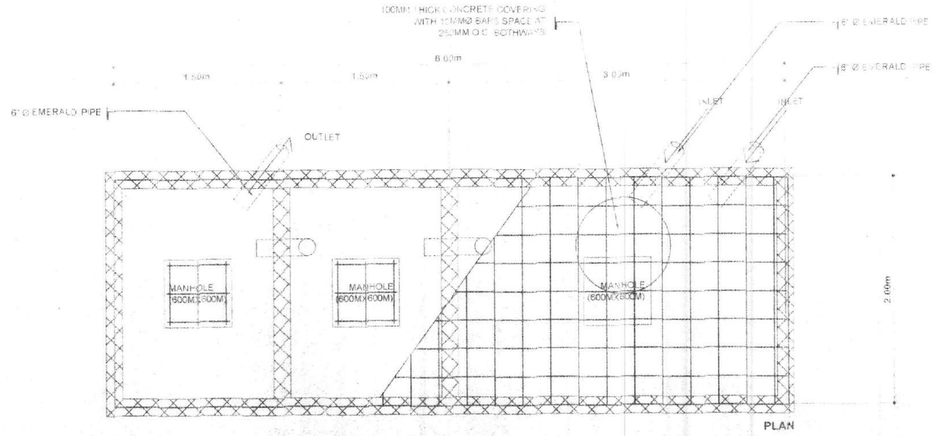
PREPARED BY:
DR. REY D. GALDA
MASTER PLUMBER
PRC NO. : 2332 PTR NO. : 2709982
TIN NO. : 192 158 491 DATE ISSUED: 1-05-15

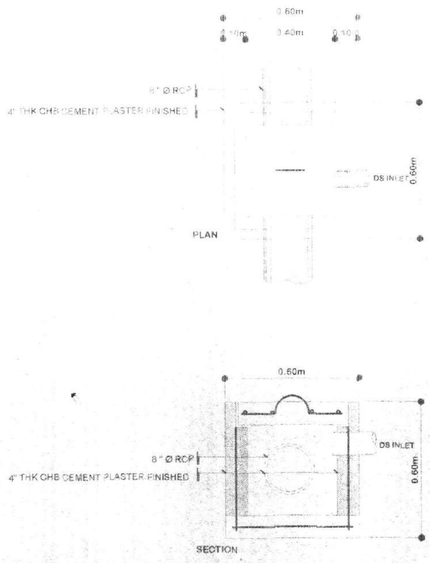
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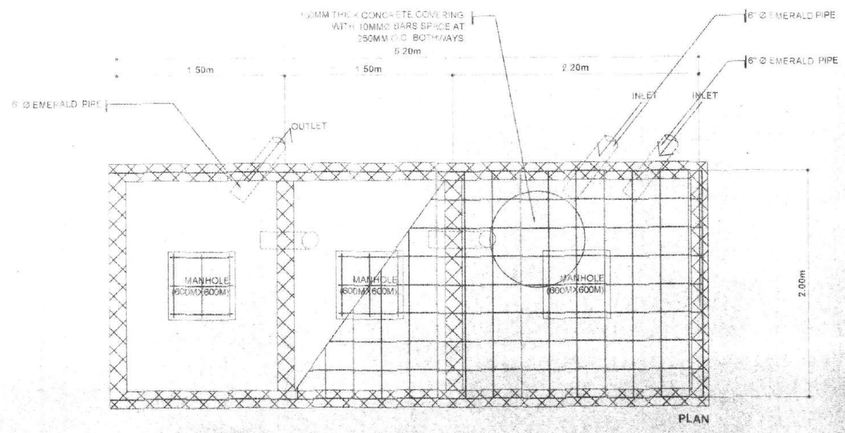
RECOMMENDING APPROVAL:
ATTY. JONATHAN S. OCHE
DIRECTOR, ADMINISTRATION

APPROVED:
DR. RICARDO E. ROTORAS
MUST PRESIDENT

SHEET TITLE: PLUMBING
SHEET CONTENTS: CISTERN TANK DETAIL, WATER CLOSET DETAIL
SHEET NO. P23, P24
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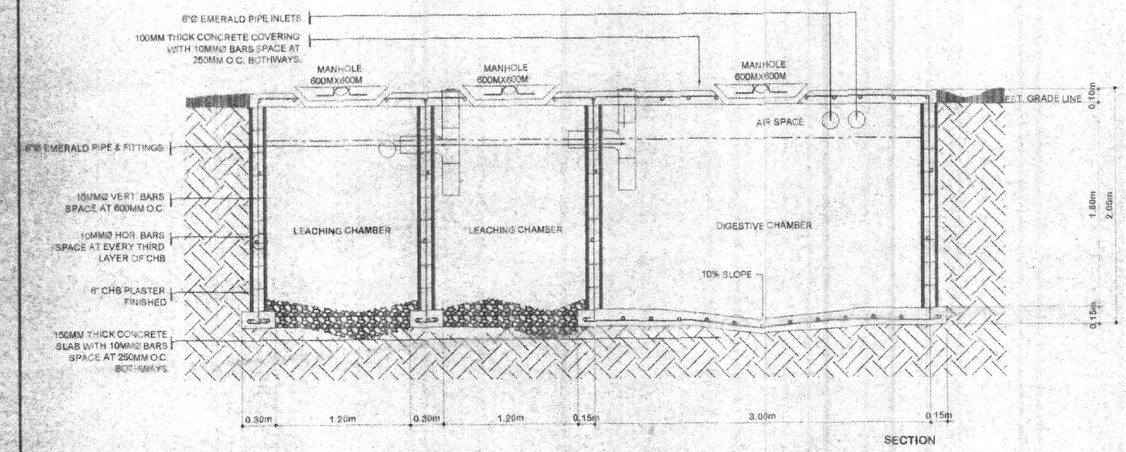






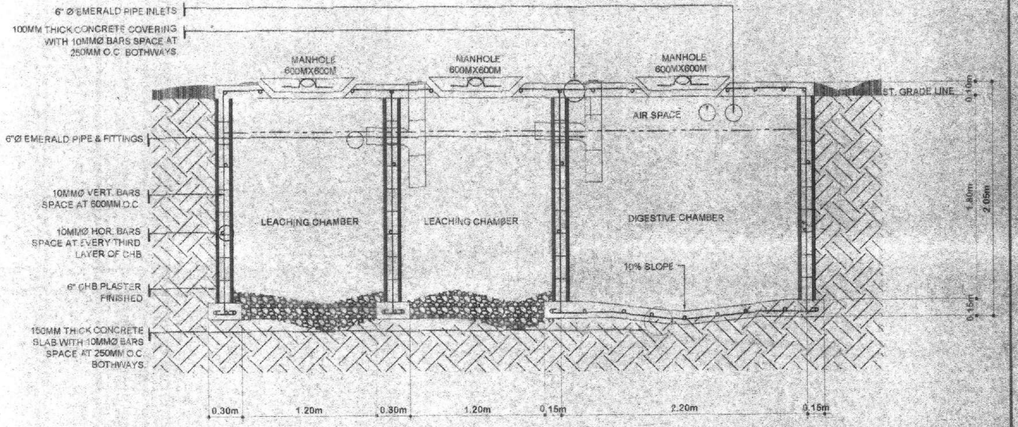
CATCH BASIN DETAIL

SCALE 1:15M



SEPTIC 1 DETAIL

SCALE 1:30M



SEPTIC 2 DETAIL

SCALE 1:30M

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TIN NO. - 102 155 45 DATE ISSUED: 1-05-15

PROJECT: **PROPOSED STUDENT CENTER & EDUCATION COMPLEX**
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MUSTI PRESIDENT

SHEET TITLE : PLUMBING	SHEET NO.
SHEET CONTENTS :	
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SEPTIC 2 DETAIL	P24

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SOIL STACK & SOIL BRANCH SIZE COMPUTATIONS

TYPES OF FIXTURES	FIXTURE UNIT VALUE	FIXTURE QUANTITY	TOTAL
WATER CLOSET	6	3	18
FLOOR DRAIN	1	6	6
LAVATORY	1	4	4
URINAL	5	2	10
SLOP SINK	1	3	3
TOTAL			**41**

SEPTIC VAULT 1 SIZE COMPUTATIONS

NUMBER OF PERSONS PER SEPTIC VAULT PER FLOOR
= 41PERSONS
NUMBER OF FLOORS SERVED PER SEPTIC VAULT
= 8 STOREY
TOTAL NUMBER OF PERSONS SERVED PER SEPTIC VAULT
= (8 STOREY) X (41 PERSONS)
= 328 PERSONS PER SEPTIC VAULT

41 FIXTURE UNITS X 8 FLOORS= 328 FIXTURE UNITS

THEREFORE, USE 150MM OR 6" DIAMETER SERIES 1000 PVC PIPES FOR BOTH SOIL STACK AND SOIL BRANCH.

QUANTITY OF SEWAGE FLOW FOR SCHOOL W/O GYM, SHOWERS
= 15 GALLONS PER PERSON PER DAY
= (15 GALLONS PER PERSON PER DAY) X (48 PERSONS)
= 4,920 GALLONS

DETERMINE THE VOLUME OF SEPTIC VAULT
V = 1.125 + 0.75 (TOTAL QUANTITY OF SEWAGE FLOW FOR SCHOOL IN GALLONS)
= 1.125 + (0.75 X 4,920 GALLONS)
= 3,691.12 GALLONS

CAPACITY OF SEPTIC VAULT IN CUBIC METERS
= 3,691 GALLONS DIVIDED BY 264
= 13.90 CUBIC METERS

DIMENSIONS OF SEPTIC VAULT
ASSUMED DEPTH
= 2.00 METERS
ASSUMED WIDTH
= 2.00 METERS
LENGTH
= CAPACITY OF SEPTIC TANK IN CUBIC METERS
(ASSUMED DEPTH) X (ASSUMED WIDTH)

= 13.90 CUBIC METERS
(2.00) X (2.00)

= 3.47 METERS
TOTAL LENGTH
= L/2 + L
= 3.47/2 + 3.47
= 5.20 METERS

SOIL STACK & SOIL BRANCH SIZE COMPUTATIONS

GROUND FLOOR

TYPES OF FIXTURES	FIXTURE UNIT VALUE	FIXTURE QUANTITY	TOTAL
WATER CLOSET	6	7	42
FLOOR DRAIN	1	13	13
LAVATORY	1	9	9
URINAL	5	7	35
SLOP SINK	3	2	6
TOTAL			**105**

SECOND FLOOR

TYPES OF FIXTURES	FIXTURE UNIT VALUE	FIXTURE QUANTITY	TOTAL
WATER CLOSET	6	4	24
FLOOR DRAIN	1	10	10
LAVATORY	1	6	6
URINAL	5	4	20
SLOP SINK	3	2	6
KITCHEN SINK	2	1	2
TOTAL			**68**

THIRD FLOOR TO EIGHT FLOOR

TYPES OF FIXTURES	FIXTURE UNIT VALUE	FIXTURE QUANTITY	TOTAL
WATER CLOSET	6	4	24
FLOOR DRAIN	1	10	10
LAVATORY	1	6	6
URINAL	5	4	20
SLOP SINK	3	2	6
TOTAL			**66**

66 FIXTURE UNITS X 6 FLOORS= 396 FIXTURE UNITS
TOTAL FIXTURE UNITS = 396 + 105+68 = 569 FIXTURE UNITS
THEREFORE, USE 150MM OR 6" DIAMETER
SERIES 1000 PVC PIPES FOR BOTH SOIL STACK
AND SOIL BRANCH.

SEPTIC VAULT 2 SIZE COMPUTATIONS

TOTAL NUMBER OF PERSONS SERVED PER SEPTIC VAULT
= 569 PERSONS

QUANTITY OF SEWAGE FLOW FOR SCHOOL W/O GYM, SHOWERS
= 15 GALLONS PER PERSON PER DAY
= (15 GALLONS PER PERSON PER DAY) X (569 PERSONS)
= 8,535 GALLONS

DETERMINE THE VOLUME OF SEPTIC VAULT
V = 1.125 + 0.75 (TOTAL QUANTITY OF SEWAGE FLOW FOR SCHOOL IN GALLONS)
= 1.125 + (0.75 X 8,535 GALLONS)
= 6,402.37 GALLONS

CAPACITY OF SEPTIC VAULT IN CUBIC METERS
= 6,402.37 GALLONS DIVIDED BY 264
=24.25 CUBIC METERS

DIMENSIONS OF SEPTIC VAULT
ASSUMED DEPTH
= 2.00 METERS
ASSUMED WIDTH
= 3.00 METERS
LENGTH
= CAPACITY OF SEPTIC TANK IN CUBIC METERS
(ASSUMED DEPTH) X (ASSUMED WIDTH)

=24.25 CUBIC METERS
(2.00) X (3.00)

= 4.04 METERS
TOTAL LENGTH
= L/2 + L
= 3.03/2 + 3.03
= 6.06METERS

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PRC NO. : 2332 | PTR NO. : 2709982
TIN NO. : 152 155 491 | DATE ISSUED: 1-05-15

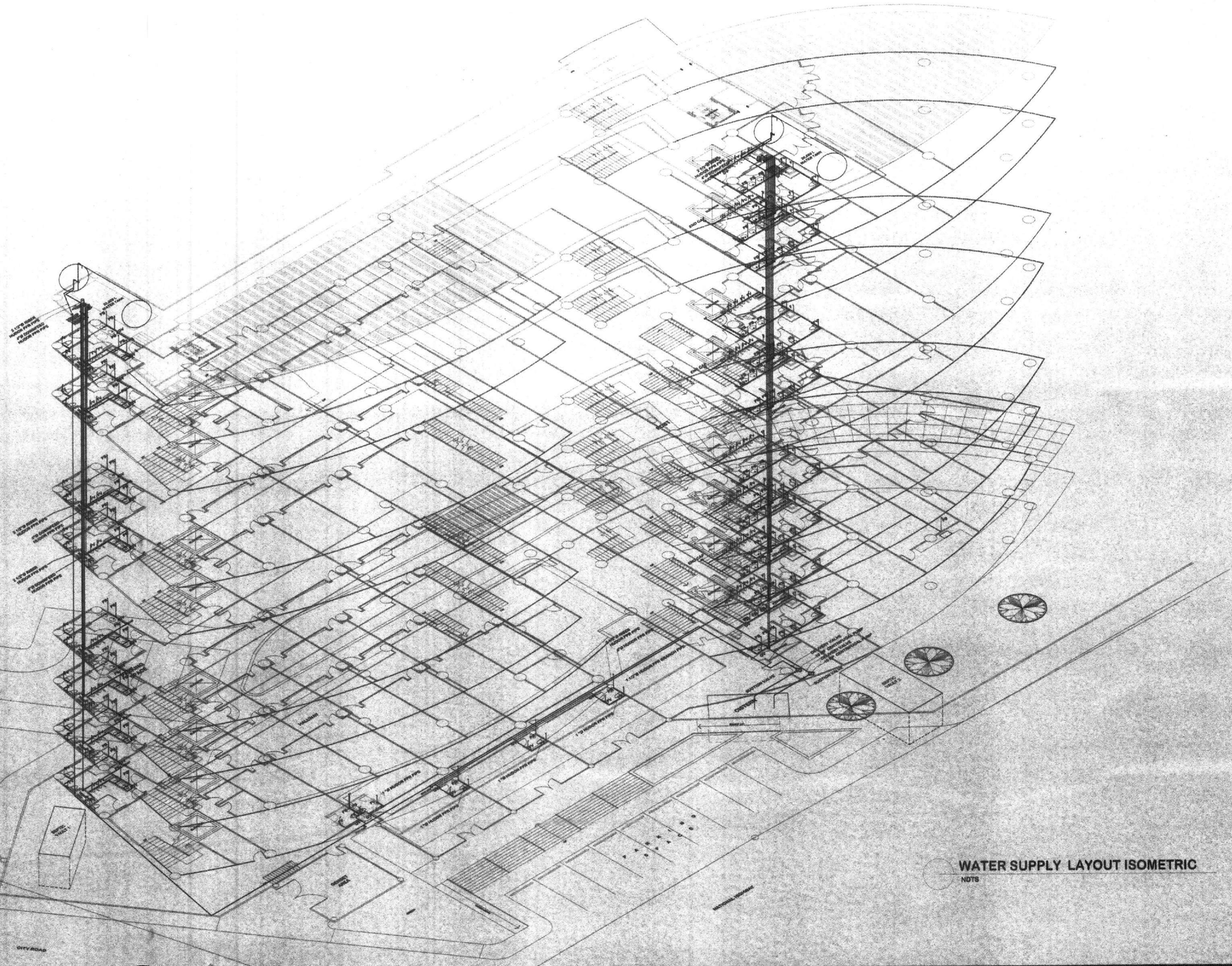
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RECOMMENDING APPROVAL :
ATTY. JONATHAN S. OCHE
DIRECTOR, ADMINISTRATION

APPROVED :
DR. RICARDO E. ROTORAS
MUST PRESIDENT

SHEET TITLE: PLUMBING
SHEET CONTENTS :

SHEET NO.
P21
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REPUBLIC OF THE PHILIPPINES
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PRC NO. : 2332 | PTR NO. : 2709982
TIN NO. : 192 155 491 | DATE ISSUED: 1-05-15

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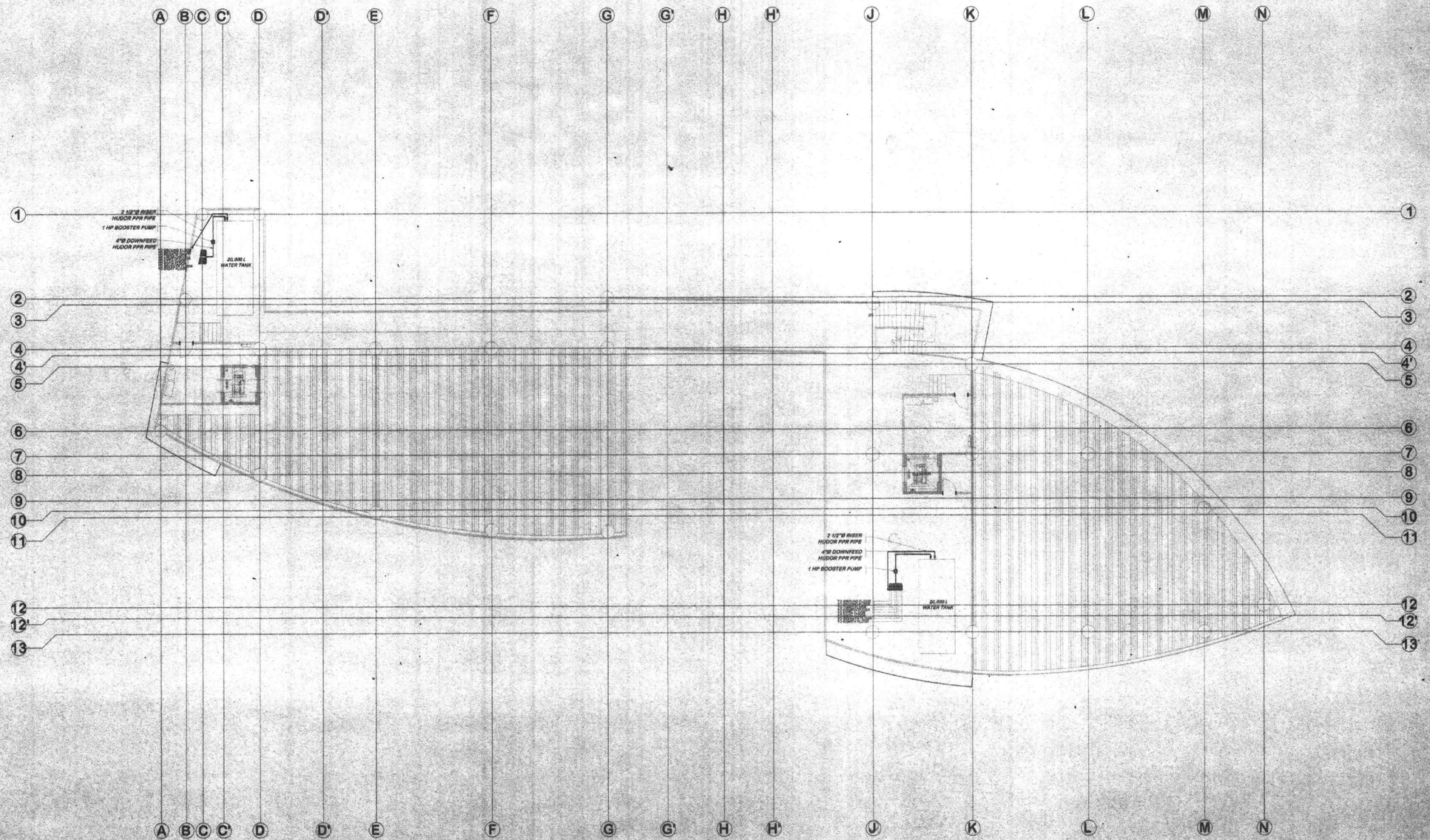
APPROVED :

DR. RICARDO E. ROTORAS
MUST PRESIDENT

SHEET TITLE: PLUMBING
SHEET CONTENTS :
WATER SUPPLY LAYOUT ISOMETRIC

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SYMBOLS

WC	WATER CLOSET (LEGATO ELONGATED 6 LPF TOP-INLET FLUSH VALVE TYPE WATER CLOSET.)
URI	URINAL (SLOAN GEM 3.8 LPF FLUSH VALVE FITTINGS.)
LAV	LAVATORY (AVALON UNDERCOUNTER FAUCET-SQUARE LEVER HANDLE ON ROUND BODY, SINGLE HOLE ELONGATED BASIN MIXER SUPPLIED WITH PUSH BUTTON POP-UP ASSEMBLY.)
GV	GATE VALVE
M	MOTOR
CP	CENTRIFUGAL PUMP
BP	BOOSTER PUMP
FD	FLOOR DRAIN
DS	DOWNSPOUT (USE 4"Ø EMERALD PIPE)
CO	CLEANOUT
RCP	REINF. CONCRETE PIPE
VTR	VENT THRU ROOF
VTC	VENT THRU CEILING
FV	FLUSH VALVE
PB	PUSH BUTTON
WS	WASTE STACK
SS	SOIL STACK
VS	VENT STACK

ROOF DECK WATER SUPPLY LAYOUT

SCALE 1:150M

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TIN NO. : 192 155 491 | DATE ISSUED: 1-05-16

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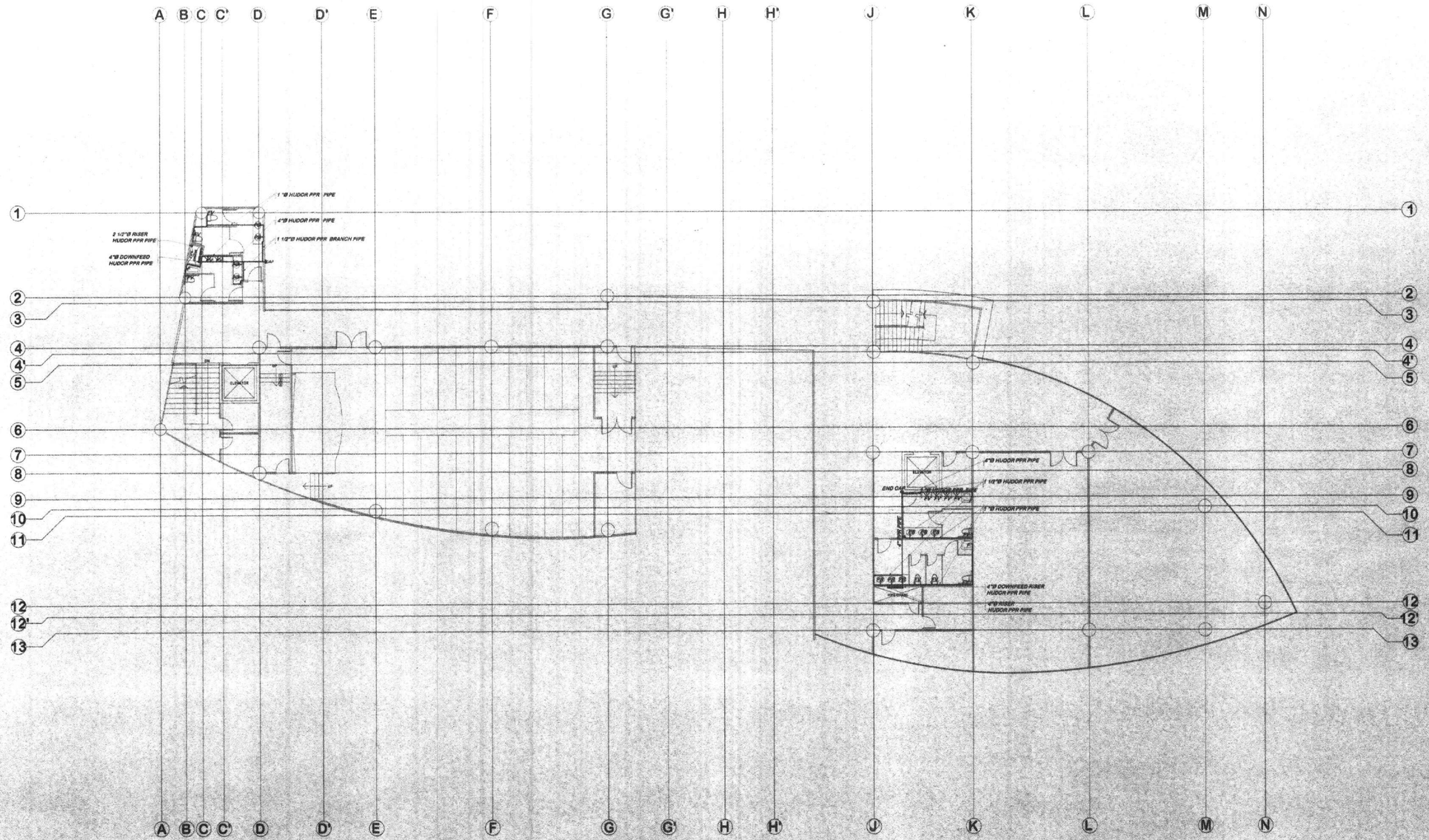
APPROVED :

DR. RICARDO E. ROTORAS
MUST PRESIDENT

SHEET TITLE: PLUMBING
SHEET CONTENTS :
ROOF DECK WATER SUPPLY LAYOUT

SHEET NO.
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SYMBOLS

WC	WATER CLOSET (LEGATO ELONGATED 6 LPF TOP-INLET FLUSH VALVE TYPE WATER CLOSET .)
URI	URINAL (SLOAN GEM 3.8 LPF FLUSH VALVE FITTINGS.)
LAV	LAVATORY (AVALON UNDERCOUNTER FAUCET-SQUARE LEVER HANDLE ON ROUND BODY, SINGLE HOLE ELONGATED BASIN MIXER SUPPLIED WITH PUSH BUTTON POP-UP ASSEMBLY.)
GV	GATE VALVE
M	MOTOR
CP	CENTRIFUGAL PUMP
BP	BOOSTER PUMP
FD	FLOOR DRAIN
DS	DOWNSPOUT (USE 4"Ø EMERALD PIPE)
CO	CLEANOUT
RCP	REINF. CONCRETE PIPE
VTR	VENT THRU ROOF
VTC	VENT THRU CEILING
FV	FLUSH VALVE
PB	PUSH BUTTON
WS	WASTE STACK
SS	SOIL STACK
VS	VENT STACK

EIGHTH FLOOR WATER SUPPLY LAYOUT

SCALE 1:150M

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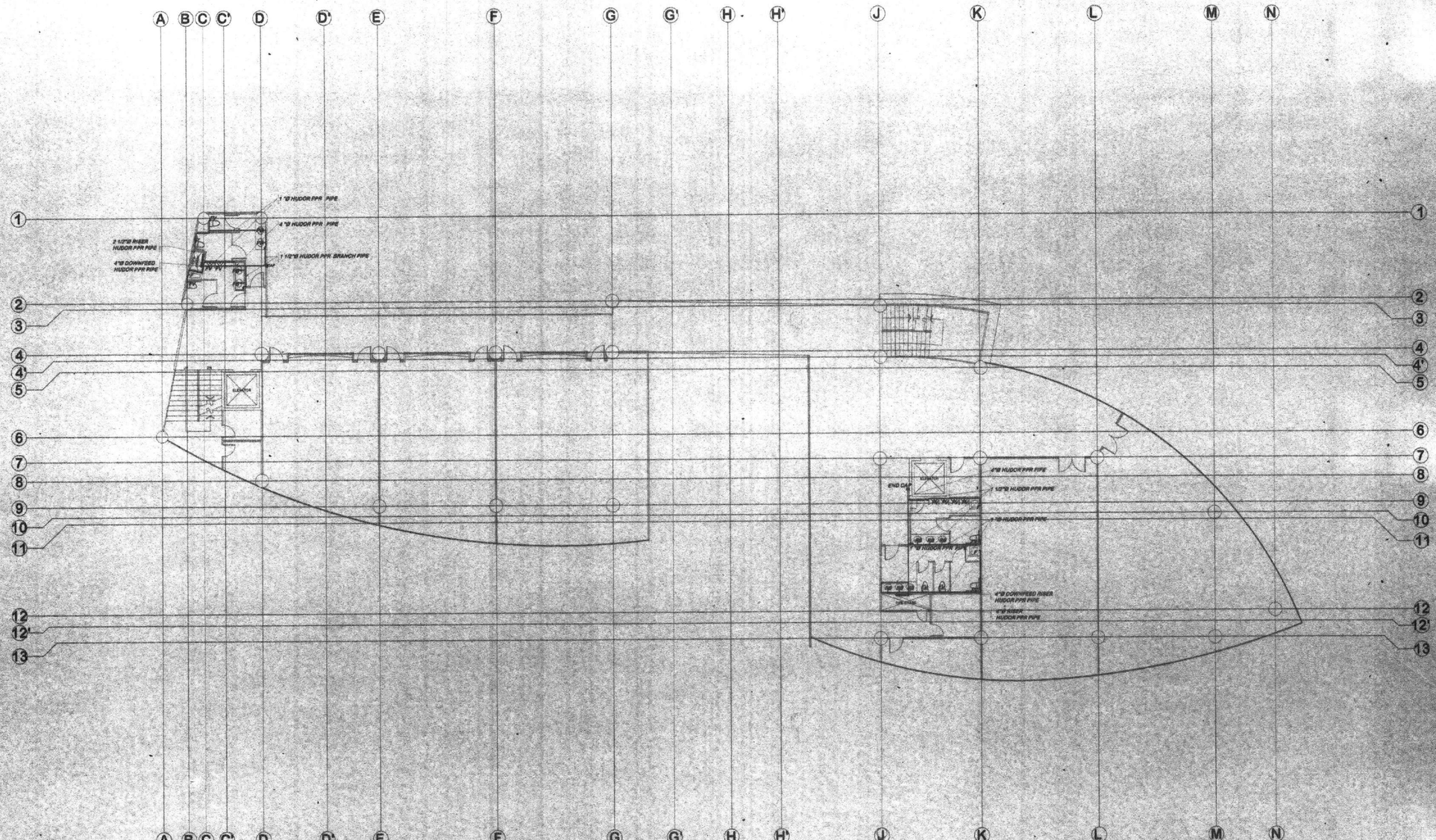
APPROVED :

DR. RICARDO E. ROTORAS
MUST PRESIDENT

SHEET TITLE: PLUMBING
SHEET CONTENTS : EIGHTH FLOOR WATER SUPPLY LAYOUT

SHEET NO
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SYMBOLS

WC	WATER CLOSET (LEGATO ELONGATED 6 LPF TOP-INLET FLUSH VALVE TYPE WATER CLOSET.)
URI	URINAL (SLOAN GEM 3.8 LPF FLUSH VALVE FITTINGS.)
LAV	LAVATORY (AVALON UNDERCOUNTER FAUCET-SQUARE LEVER HANDLE ON ROUND BODY, SINGLE HOLE ELONGATED BASIN MIXER SUPPLIED WITH PUSH BUTTON POP-UP ASSEMBLY.)
GV	GATE VALVE
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CO	CLEANOUT
RCP	REINF. CONCRETE PIPE
VTR	VENT THRU ROOF
VTC	VENT THRU CEILING
FV	FLUSH VALVE
PB	PUSH BUTTON
WS	WASTE STACK
SS	SOIL STACK
VS	VENT STACK

SEVENTH FLOOR WATER SUPPLY LAYOUT

SCALE 1:150M

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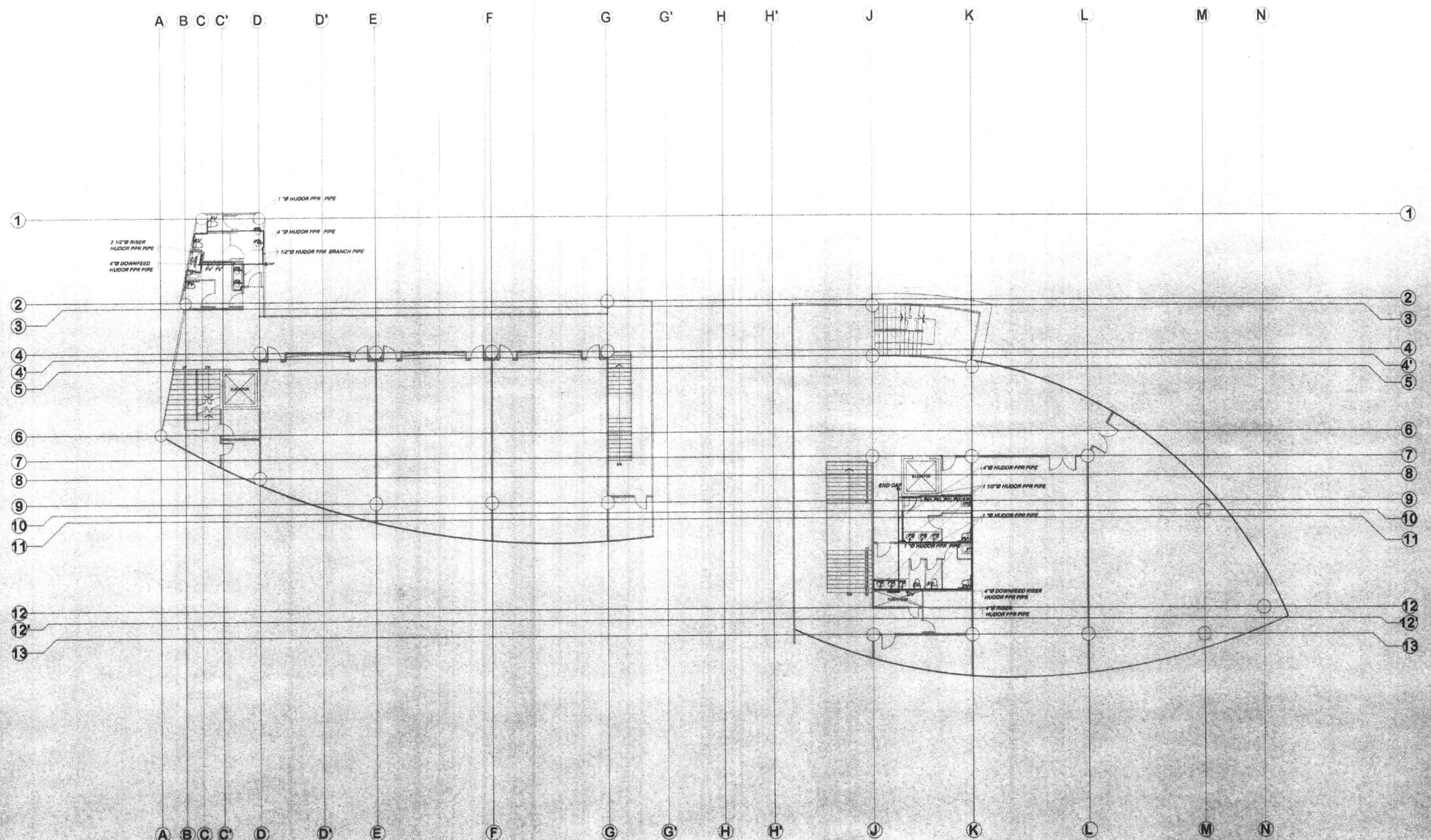
APPROVED :

DR. RICARDO E. ROTORAS
MUST PRESIDENT

SHEET TITLE: PLUMBING
SHEET CONTENTS:
SEVENTH FLOOR WATER SUPPLY LAYOUT

SHEET NO. P17 P24

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SYMBOLS

WC	WATER CLOSET (LEGATO ELONGATED 6 LPF TOP-INLET FLUSH VALVE TYPE WATER CLOSET .)
URI	URINAL (SLOAN GEM 3.8 LPF FLUSH VALVE FITTINGS.)
LAV	LAVATORY (AVALON UNDERCOUNTER FAUCET-SQUARE LEVER HANDLE ON ROUND BODY, SINGLE HOLE ELONGATED BASIN MIXER SUPPLIED WITH PUSH BUTTON POP-UP ASSEMBLY.)
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RCP	REINF. CONCRETE PIPE
VTR	VENT THRU ROOF
VTC	VENT THRU CEILING
FV	FLUSH VALVE
PB	PUSH BUTTON
WS	WASTE STACK
SS	SOIL STACK
VS	VENT STACK

SIXTH FLOOR WATER SUPPLY LAYOUT

SCALE 1:150M

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PRC NO. : 2332 PTR NO. : 2709962
TIN NO. : 192 155 491 DATE ISSUED: 1-05-15

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LOCATION: C.M. RECTO AVENUE LAPASAN, CAGAYAN DE ORO CITY
OWNER : MINDANAO UNIVERSITY OF SCIENCE AND TECHNOLOGY

RECOMMENDING APPROVAL :

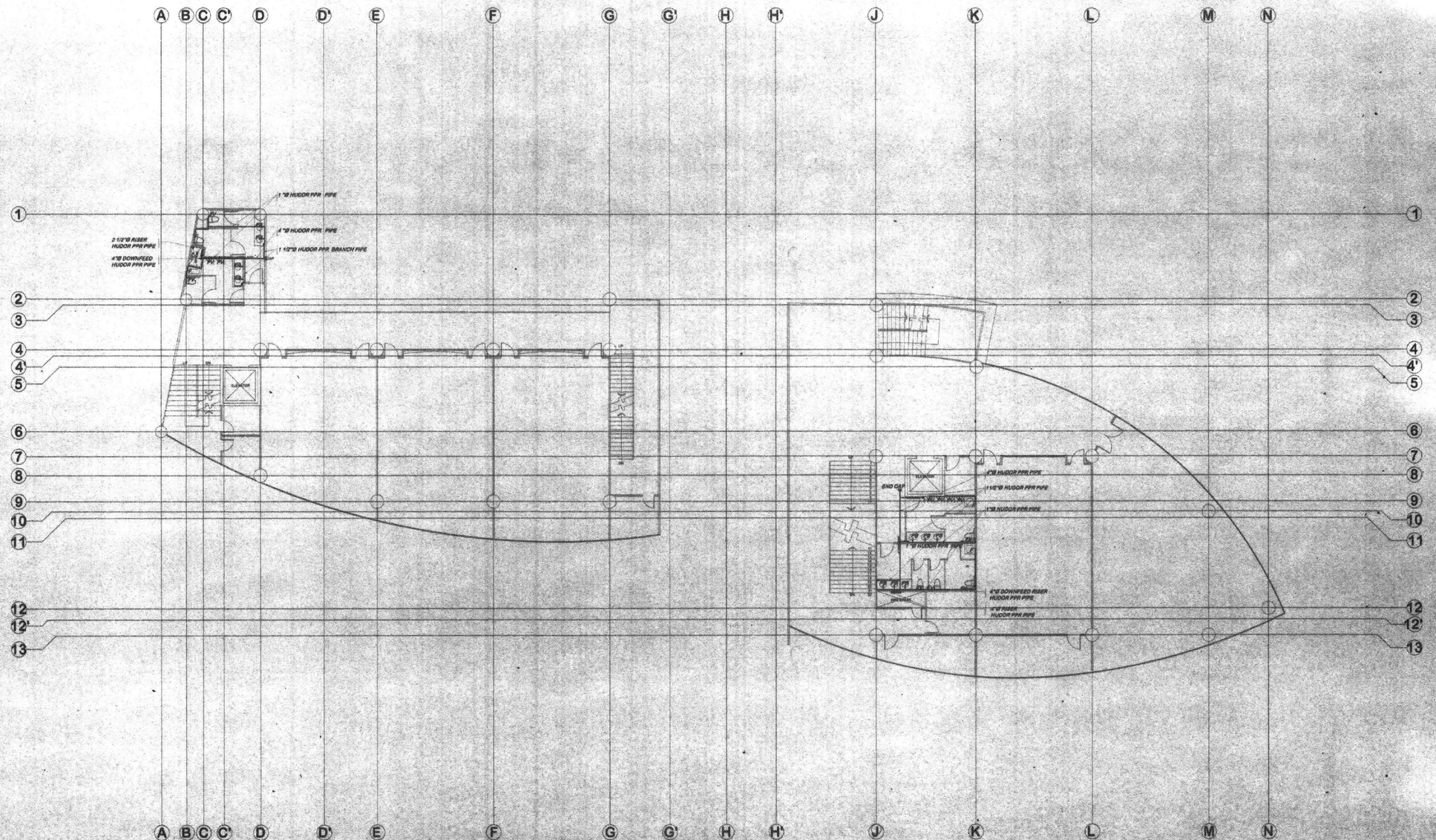
ATTY. JONATHAN S. OCHE
DIRECTOR, ADMINISTRATION

APPROVED :

DR. RICARDO E. ROTORAS
MUST PRESIDENT

SHEET TITLE: PLUMBING	SHEET NO.
SHEET CONTENTS : SIXTH FLOOR WATER SUPPLY LAYOUT	P16 / P24

147
198



SYMBOLS

WC	WATER CLOSET (LEGATO ELONGATED 6 LPF TOP-INLET FLUSH VALVE TYPE WATER CLOSET.)
URI.	URINAL (SLOAN GEM 3.5 LPF FLUSH VALVE FITTINGS.)
LAV	LAVATORY (AVALON UNDERCOUNTER FAUCET-SQUARE LEVER HANDLE ON ROUND BODY, SINGLE HOLE ELONGATED BASIN MIXER SUPPLIED WITH PUSH BUTTON POP-UP ASSEMBLY.)
GV	GATE VALVE
M	MOTOR
CP	CENTRIFUGAL PUMP
BP	BOOSTER PUMP
FD	FLOOR DRAIN
DS	DOWNSPOUT (USE 4"Ø EMERALD PIPE)
CO	CLEANOUT
RCP	REINF. CONCRETE PIPE
VTR	VENT THRU ROOF
VTC	VENT THRU CEILING
FV	FLUSH VALVE
PB	PUSH BUTTON
WS	WASTE STACK
SS	SOIL STACK
VS	VENT STACK

FIFTH FLOOR WATER SUPPLY LAYOUT

SCALE 1:150M

REPUBLIC OF THE PHILIPPINES
MINDANAO UNIVERSITY OF SCIENCE & TECHNOLOGY

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PREPARED BY:

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MASTER PLUMBER

PRC NO. : 2332 PTR NO. : 2709982
TIN NO. : 192 155 491 DATE ISSUED: 1-05-15

PROJECT : **PROPOSED STUDENT CENTER & EDUCATION COMPLEX**

LOCATION: C.M. RECTO AVENUE LAPASAN, CAGAYAN DE ORO CITY
OWNER : MINDANAO UNIVERSITY OF SCIENCE AND TECHNOLOGY

RECOMMENDING APPROVAL:

ATTY. JONATHAN S. OCHE
DIRECTOR, ADMINISTRATION

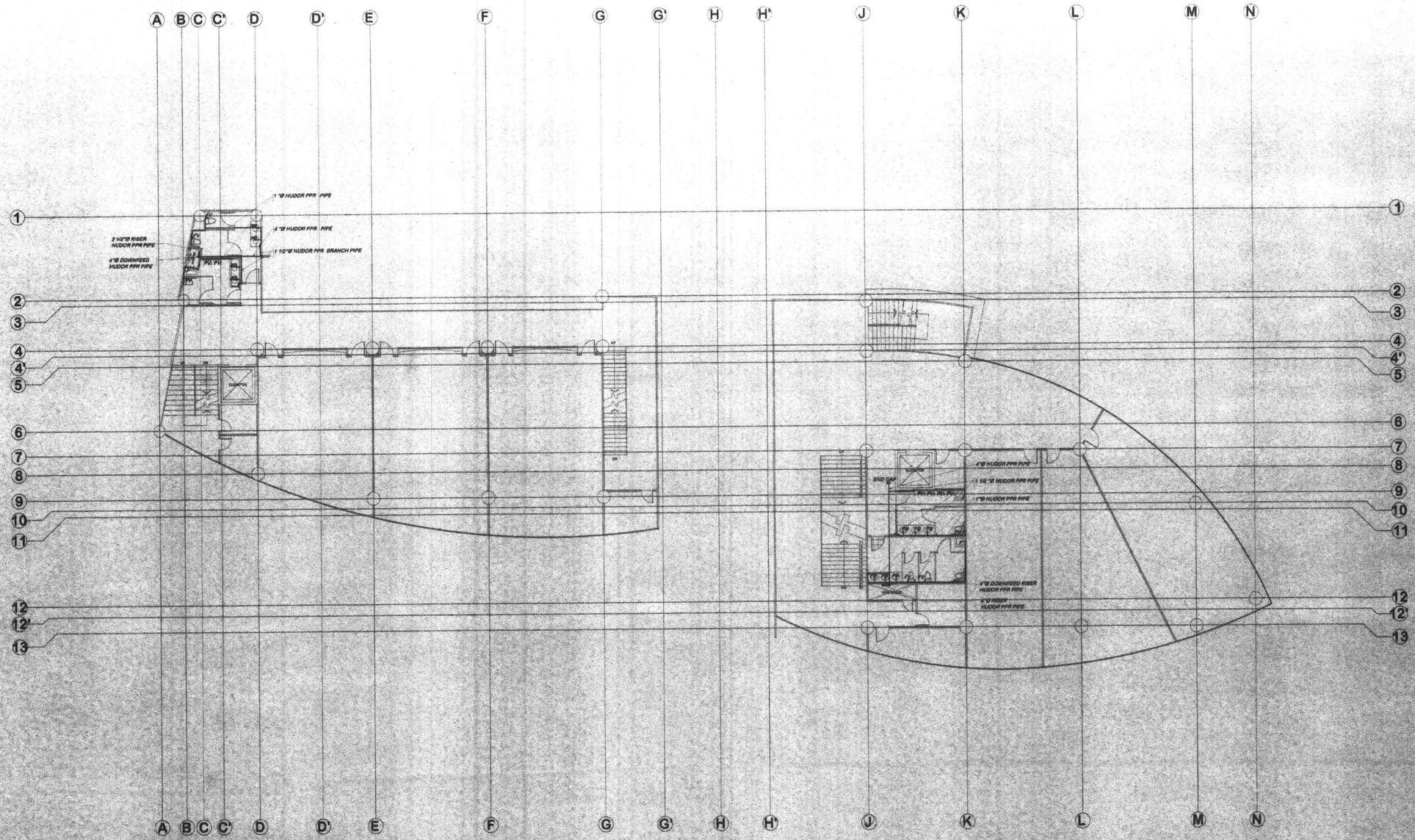
APPROVED :

DR. RICARDO E. ROTORAS
MUST PRESIDENT

SHEET TITLE: PLUMBING
SHEET CONTENTS :
FIFTH FLOOR WATER SUPPLY LAYOUT

SHEET NO.
P15
P24

146
198



SYMBOLS

WC	WATER CLOSET (LEGATO ELONGATED 6 LPF TOP-INLET FLUSH VALVE TYPE WATER CLOSET.)
URI	URINAL (SLOAN GEM 3.8 LPF FLUSH VALVE FITTINGS.)
LAV	LAVATORY (AVALON UNDERCOUNTER FAUCET-SQUARE LEVER HANDLE ON ROUND BODY, SINGLE HOLE ELONGATED BASIN MIXER SUPPLIED WITH PUSH BUTTON POP-UP ASSEMBLY.)
GV	GATE VALVE
M	MOTOR
CP	CENTRIFUGAL PUMP
BP	BOOSTER PUMP
FD	FLOOR DRAIN
DS	DOWNSPOUT (USE 4"Ø EMERALD PIPE)
CO	CLEANOUT
RCP	REINF. CONCRETE PIPE
VTR	VENT THRU ROOF
VTC	VENT THRU CEILING
FV	FLUSH VALVE
PB	PUSH BUTTON
WS	WASTE STACK
SS	SOIL STACK
VS	VENT STACK

FOURTH FLOOR WATER SUPPLY LAYOUT

SCALE 1:150M

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TIN NO. : 192.185.491 DATE ISSUED: 1-05-15

PROJECT : **PROPOSED STUDENT CENTER & EDUCATION COMPLEX**

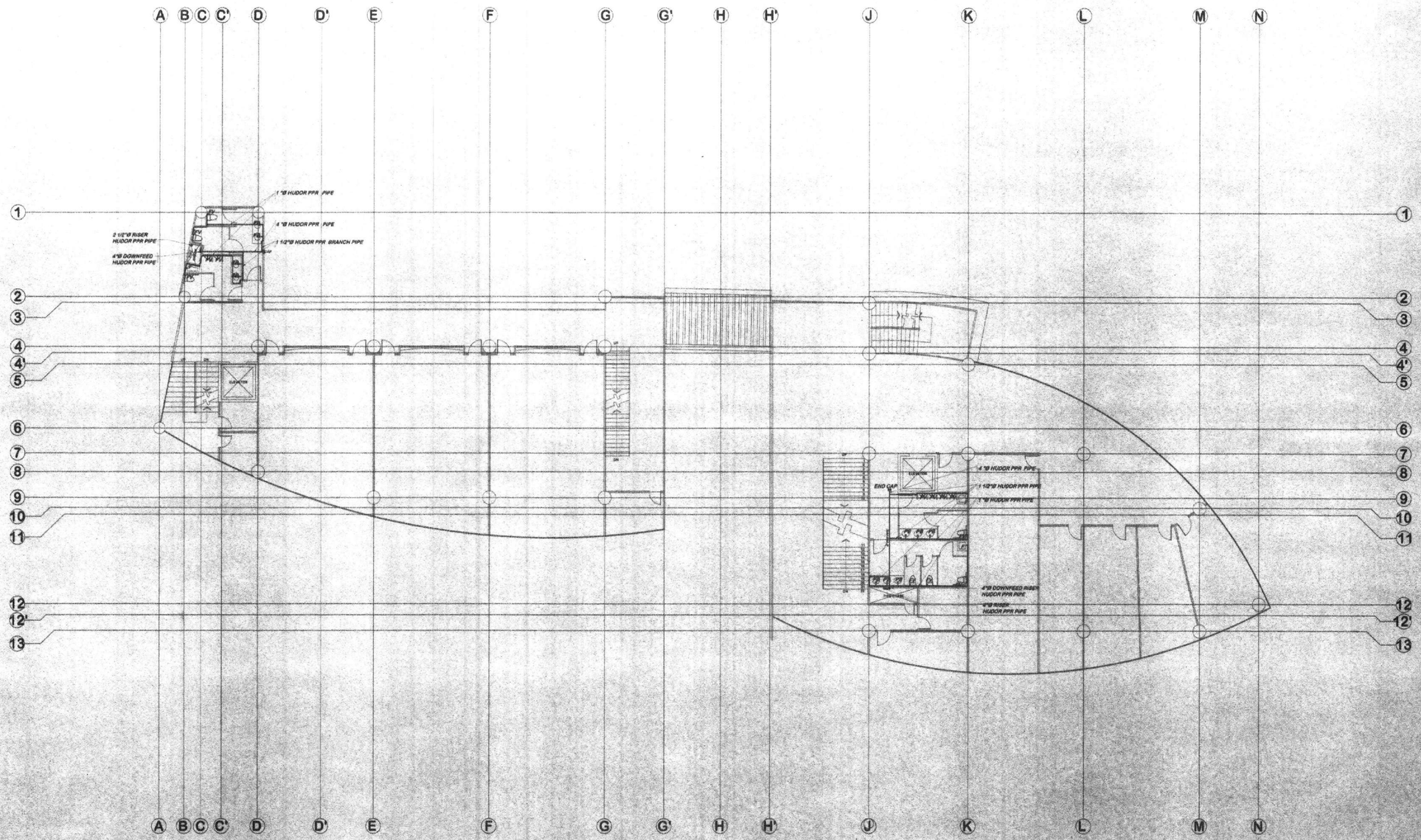
LOCATION: C.M. RECTO AVENUE LAPASAN, CAGAYAN DE ORO CITY
OWNER : MINDANAO UNIVERSITY OF SCIENCE AND TECHNOLOGY

RECOMMENDING APPROVAL :
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SHEET TITLE: PLUMBING SHEET NO.
SHEET CONTENTS :
FOURTH FLOOR WATER SUPPLY LAYOUT P14 P24

145
198



SYMBOLS

WC	WATER CLOSET (LEGATO ELONGATED 6 LPF TOP-INLET FLUSH VALVE TYPE WATER CLOSET .)
URI	URINAL (SLOAN GEM 3.8 LPF FLUSH VALVE FITTINGS.)
LAV	LAVATORY (AVALON UNDERCOUNTER FAUCET-SQUARE LEVER HANDLE ON ROUND BODY, SINGLE HOLE ELONGATED BASIN MIXER SUPPLIED WITH PUSH BUTTON POP-UP ASSEMBLY.)
GV	GATE VALVE
M	MOTOR
CP	CENTRIFUGAL PUMP
BP	BOOSTER PUMP
FD	FLOOR DRAIN
DS	DOWNSPOUT (USE 4"Ø EMERALD PIPE)
CO	CLEANOUT
RCP	REINF. CONCRETE PIPE
VTR	VENT THRU ROOF
VTC	VENT THRU CEILING
FV	FLUSH VALVE
PB	PUSH BUTTON
WS	WASTE STACK
SS	SOIL STACK
VS	VENT STACK

THIRD FLOOR WATER SUPPLY LAYOUT

SCALE 1:150M

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PROJECT : **PROPOSED STUDENT CENTER & EDUCATION COMPLEX**

LOCATION: C.M. RECTO AVENUE LAPASAN, CAGAYAN DE ORO CITY
OWNER : MINDANAO UNIVERSITY OF SCIENCE AND TECHNOLOGY

RECOMMENDING APPROVAL :

ATTY. JONATHAN S. OCHE
DIRECTOR, ADMINISTRATION

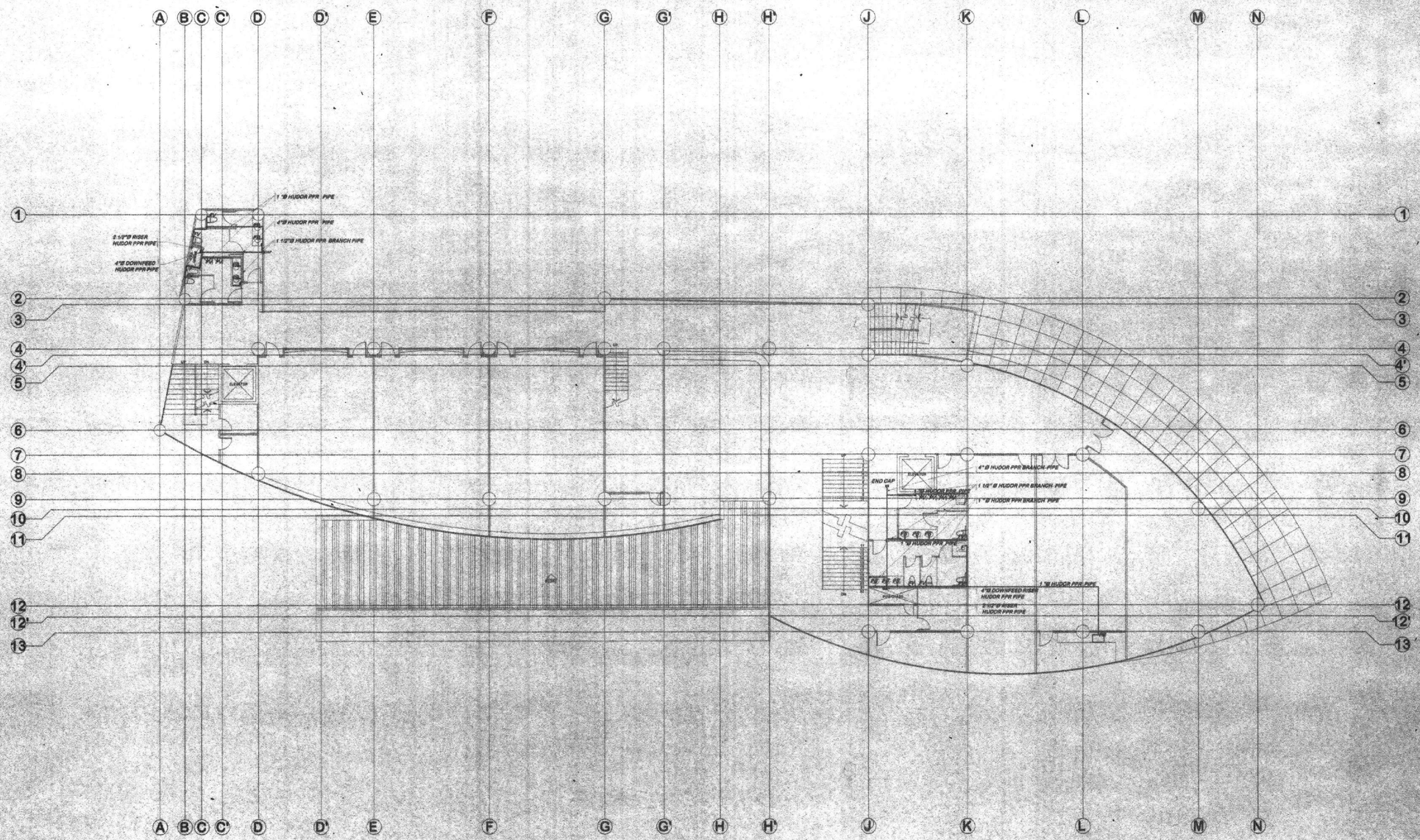
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DR. RICARDO E. ROTORAS
MUST PRESIDENT

SHEET TITLE: PLUMBING
SHEET CONTENTS :
THIRD FLOOR WATER SUPPLY LAYOUT

SHEET NO.
P13
P24

144
198



SYMBOLS

WC	WATER CLOSET (LEGATO ELONGATED 6 LPF TOP-INLET FLUSH VALVE TYPE WATER CLOSET .)
URI	URINAL (SLOAN GEM 3.8 LPF FLUSH VALVE FITTINGS.)
LAV	LAVATORY (AVALON UNDERCOUNTER FAUCET-SQUARE LEVER HANDLE ON ROUND BODY, SINGLE HOLE ELONGATED BASIN MIXER SUPPLIED WITH PUSH BUTTON POP-UP ASSEMBLY.)
GV	GATE VALVE
M	MOTOR
CP	CENTRIFUGAL PUMP
BP	BOOSTER PUMP
FD	FLOOR DRAIN
DS	DOWNSPOUT (USE 4"Ø EMERALD PIPE)
CO	CLEANOUT
RCP	REINF. CONCRETE PIPE
VTR	VENT THRU ROOF
VTC	VENT THRU CEILING
FV	FLUSH VALVE
PB	PUSH BUTTON
WS	WASTE STACK
SS	SOIL STACK
VS	VENT STACK

SECOND FLOOR WATER SUPPLY LAYOUT

SCALE 1:150M

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TIN NO. : 192 155 491 DATE ISSUED: 1-05-15

PROJECT: **PROPOSED STUDENT CENTER & EDUCATION COMPLEX**
LOCATION: C.M. RECTO AVENUE LAPASAN, CAGAYAN DE ORO CITY
OWNER : MINDANAO UNIVERSITY OF SCIENCE AND TECHNOLOGY

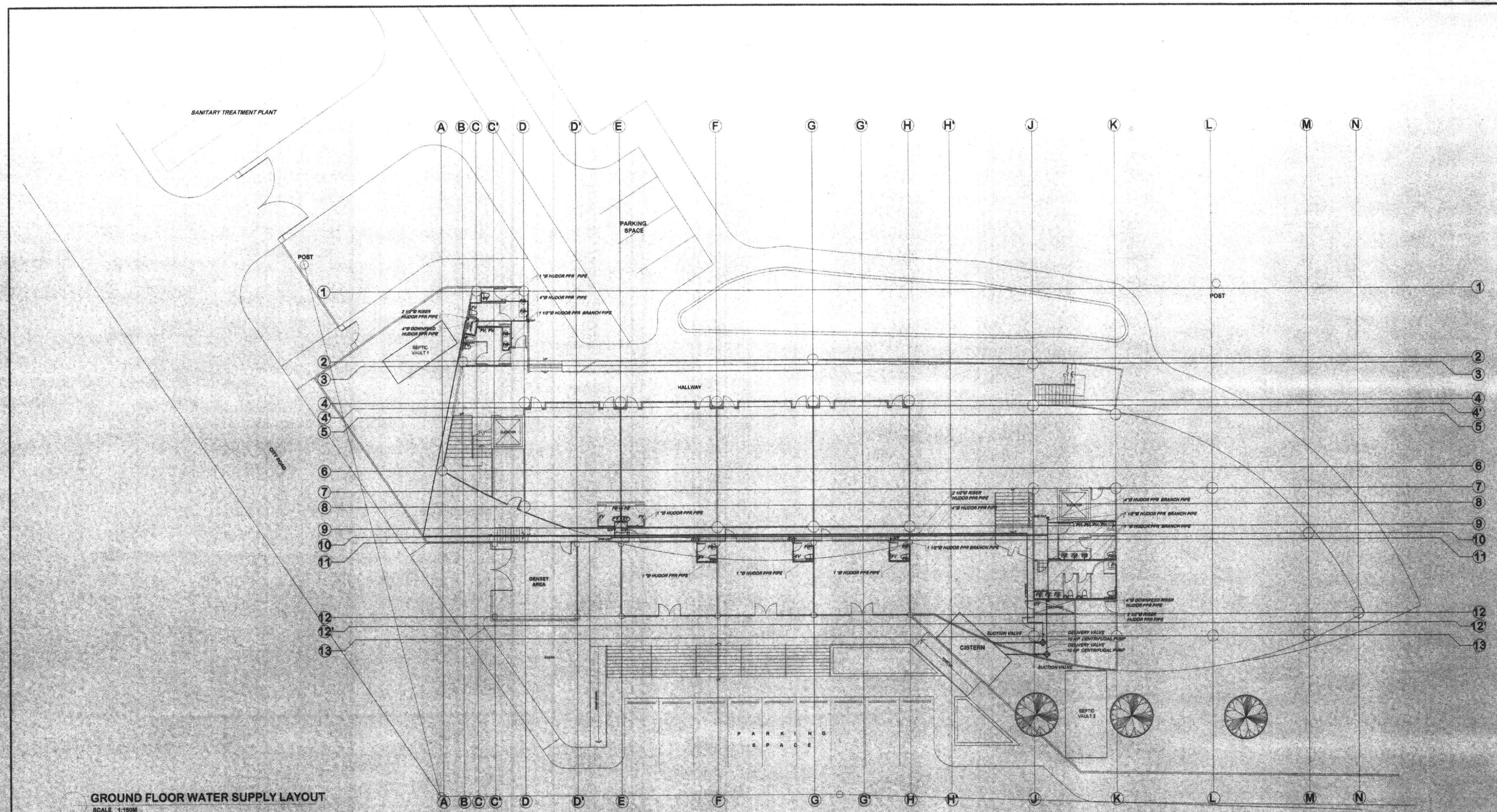
RECOMMENDING APPROVAL :
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DR. RICARDO E. ROTORAS
MUST PRESIDENT

SHEET TITLE: PLUMBING
SHEET CONTENTS :
SECOND FLOOR WATER SUPPLY LAYOUT

SHEET NO.
P12
P24

143
198



GROUND FLOOR WATER SUPPLY LAYOUT

SCALE 1:150M

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TIN NO. : 192 155 461 DATE ISSUED: 1-05-15

PROJECT : **PROPOSED STUDENT CENTER & EDUCATION COMPLEX**

LOCATION: C.M. RECTO AVENUE LAPASAN, CAGAYAN DE ORO CITY
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RECOMMENDING APPROVAL :

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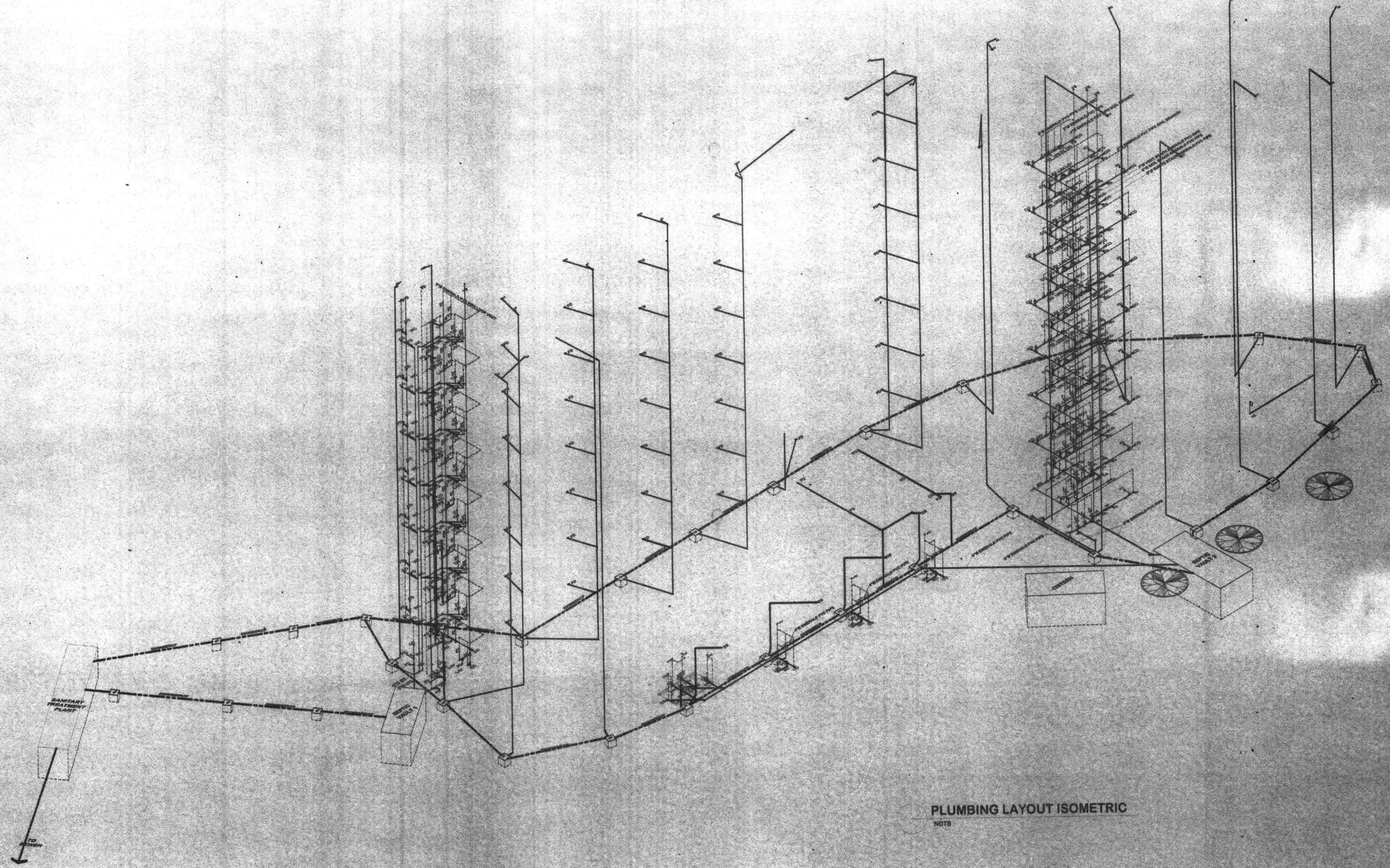
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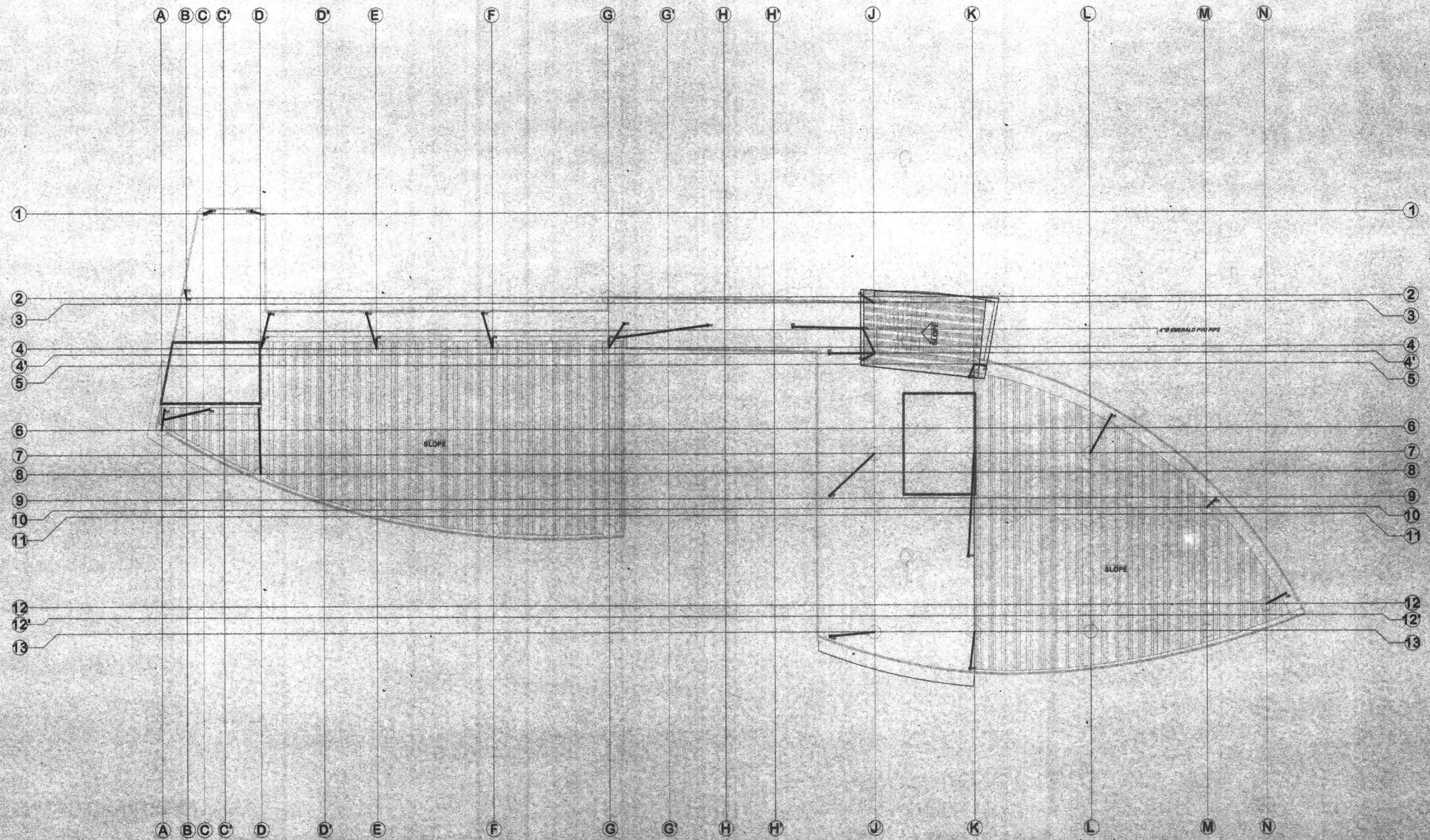
DR. RICARDO E. ROTORAS
MUST PRESIDENT

SHEET TITLE: PLUMBING
SHEET CONTENTS :
GROUND FLOOR WATER SUPPLY LAYOUT

SHEET NO.
P11
P24

142
198


SANITARY TREATMENT PLANT
SEPTIC TANK 1
SEPTIC TANK 2
SEPTIC TANK 3
SEPTIC TANK 4
SEPTIC TANK 5
SEPTIC TANK 6
SEPTIC TANK 7
SEPTIC TANK 8
SEPTIC TANK 9
SEPTIC TANK 10
SEPTIC TANK 11
SEPTIC TANK 12
SEPTIC TANK 13
SEPTIC TANK



SYMBOLS

WC	WATER CLOSET (LEGATO ELONGATED 6 LPF TOP-INLET FLUSH VALVE TYPE WATER CLOSET .)
URI	URINAL (SLOAN OEM 3.8 LPF FLUSH VALVE FITTINGS.)
LAV	LAVATORY (AVALON UNDERCOUNTER FAUCET-SQUARE LEVER HANDLE ON ROUND BODY, SINGLE HOLE ELONGATED BASIN MIXER SUPPLIED WITH PUSH BUTTON POP-UP ASSEMBLY.)
GV	GATE VALVE
M	MOTOR
CP	CENTRIFUGAL PUMP
BP	BOOSTER PUMP
FD	FLOOR DRAIN
DS	DOWNSPOUT (USE 4"Ø EMERALD PIPE)
CO	CLEANOUT
RCP	REINF. CONCRETE PIPE
VTR	VENT THRU ROOF
VTC	VENT THRU CEILING
FV	FLUSH VALVE
PB	PUSH BUTTON
WS	WASTE STACK
SS	SOIL STACK
VS	VENT STACK
CB	CATCH BASIN
MH	MANHOLE

ROOF DECK PLUMBING LAYOUT

SCALE 1:150M

REPUBLIC OF THE PHILIPPINES
MINDANAO UNIVERSITY OF SCIENCE & TECHNOLOGY

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PROJECT : **PROPOSED STUDENT CENTER & EDUCATION COMPLEX**
LOCATION : C.M. RECTO AVENUE LAPASAN, CAGAYAN DE ORO CITY
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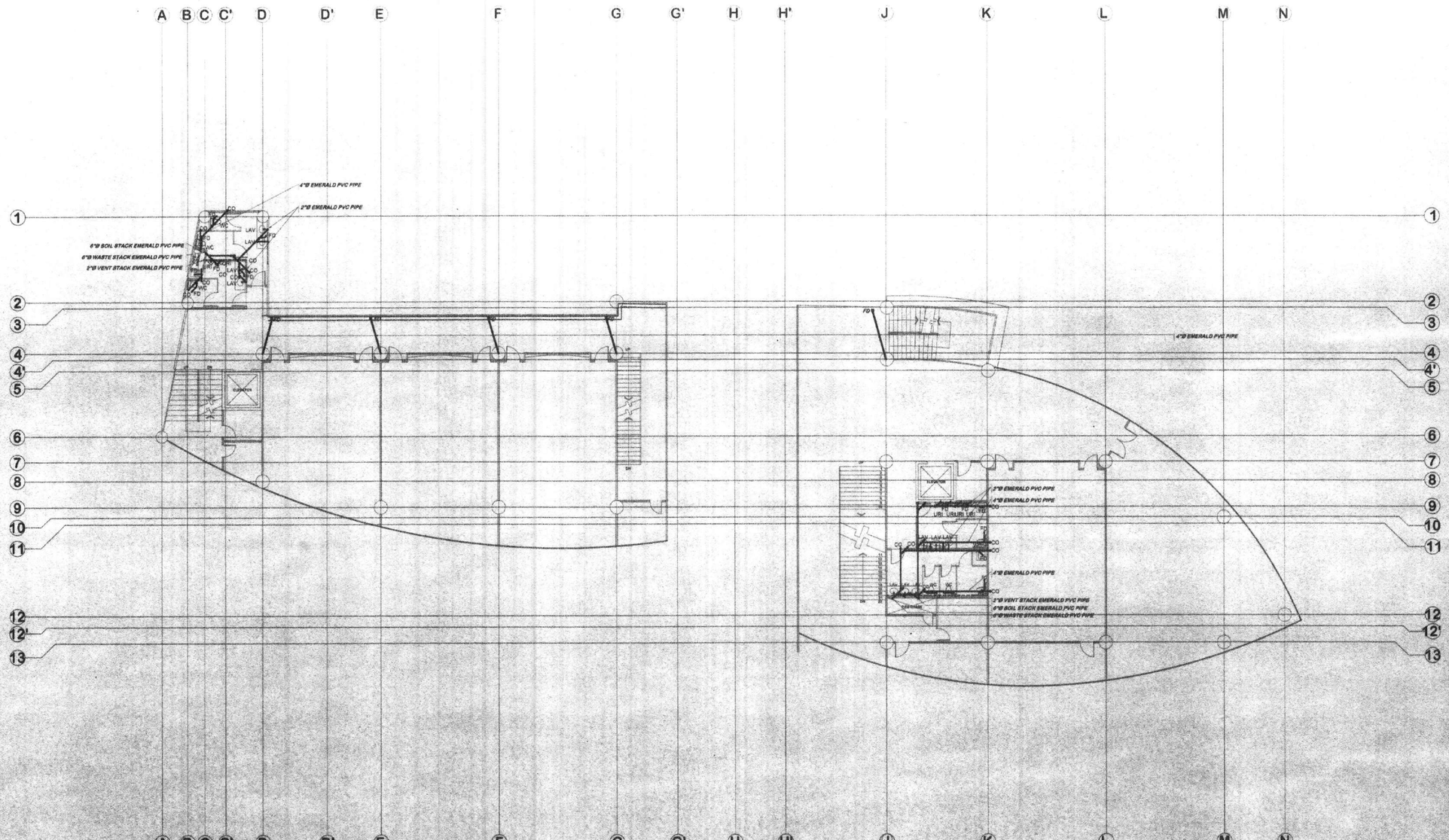
RECOMMENDING APPROVAL :
ATTY. JONATHAN S. OCHE
DIRECTOR, ADMINISTRATION

APPROVED :
DR. RICARDO E. ROTORAS
MUST PRESIDENT

SHEET TITLE: PLUMBING
SHEET CONTENTS :
ROOF DECK PLUMBING LAYOUT

SHEET NO.
P9
P24

140
198



SYMBOLS

WC	WATER CLOSET (LEGATO ELONGATED 6 LPF TOP-INLET FLUSH VALVE TYPE WATER CLOSET.)
URI	URINAL (SLOAN GEM 3.8 LPF FLUSH VALVE FITTINGS.)
LAV	LAVATORY (AVALON UNDERCOUNTER FAUCET-SQUARE LEVER HANDLE ON ROUND BODY, SINGLE HOLE ELONGATED BASIN MIXER SUPPLIED WITH PUSH BUTTON POP-UP ASSEMBLY.)
GV	GATE VALVE
M	MOTOR
CP	CENTRIFUGAL PUMP
BP	BOOSTER PUMP
FD	FLOOR DRAIN
DS	DOWNSPOUT (USE 4"Ø EMERALD PIPE)
CO	CLEANOUT
RCP	REINF. CONCRETE PIPE
VTR	VENT THRU ROOF
VTC	VENT THRU CEILING
FV	FLUSH VALVE
PB	PUSH BUTTON
WS	WASTE STACK
SS	SOIL STACK
VS	VENT STACK
CB	CATCH BASIN
MH	MANHOLE

EIGHT FLOOR PLUMBING LAYOUT

SCALE 1:150M

REPUBLIC OF THE PHILIPPINES
MINDANAO UNIVERSITY OF SCIENCE & TECHNOLOGY

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TIN NO. : 192 165 491 DATE ISSUED: 1-05-15

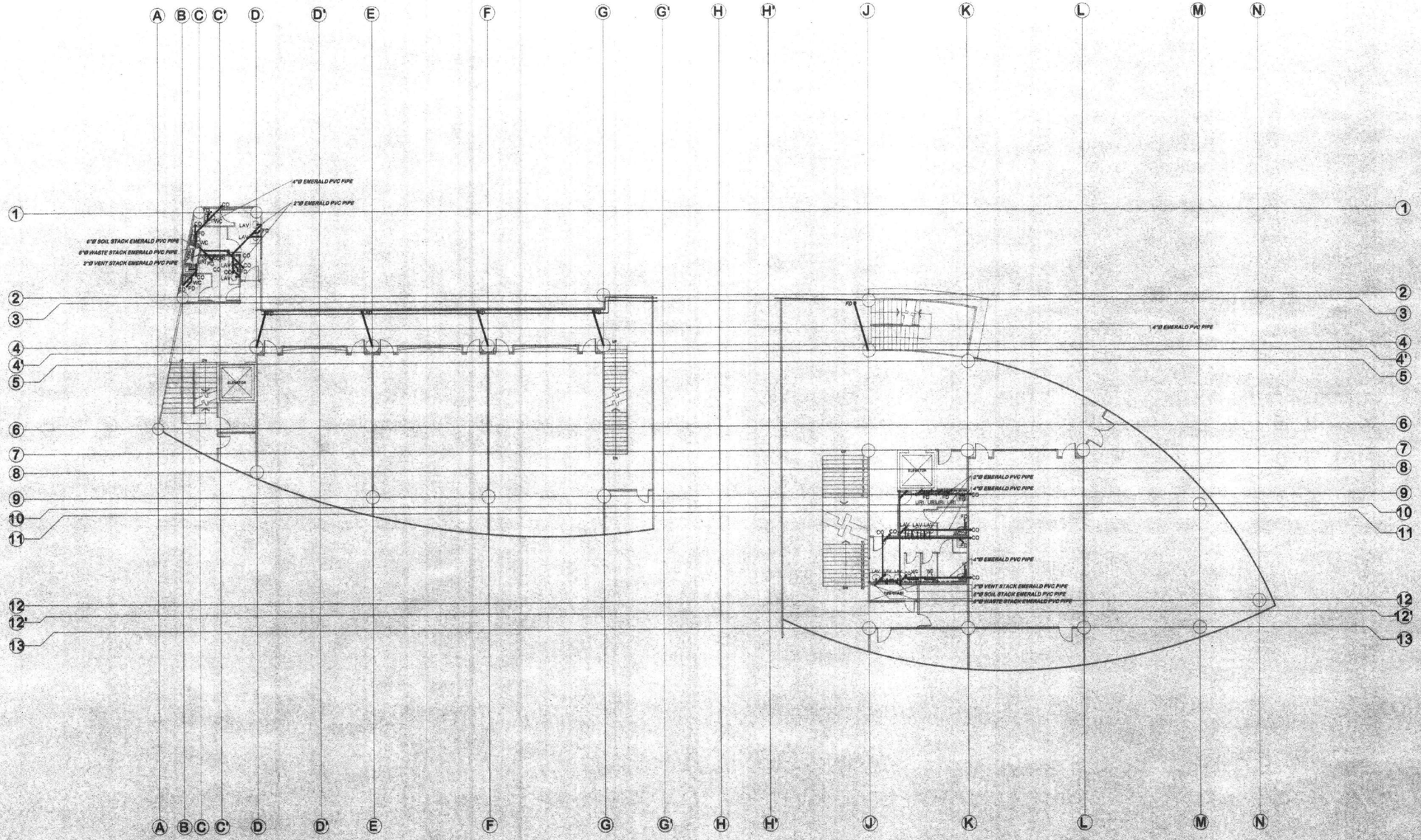
PROJECT : PROPOSED STUDENT CENTER & EDUCATION COMPLEX
LOCATION: C.M. RECTO AVENUE LAPASAN, CAGAYAN DE ORO CITY
OWNER : MINDANAO UNIVERSITY OF SCIENCE AND TECHNOLOGY

RECOMMENDING APPROVAL :
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APPROVED :
DR. RICARDO E. ROTORAS
MUST PRESIDENT

SHEET TITLE: PLUMBING SHEET NO.
SHEET CONTENTS : P8
EIGHT FLOOR PLUMBING LAYOUT P24

139
198



SYMBOLS

WC	WATER CLOSET (LEGATO ELONGATED 6 LPF TOP-INLET FLUSH VALVE TYPE WATER CLOSET .)
URI	URINAL (SLOAN GEM 3.8 LPF FLUSH VALVE FITTINGS.)
LAV	LAVATORY (AVALON UNDERCOUNTER FAUCET-SQUARE LEVER HANDLE ON ROUND BODY, SINGLE HOLE ELONGATED BASIN MIXER SUPPLIED WITH PUSH BUTTON POP-UP ASSEMBLY.)
GV	GATE VALVE
M	MOTOR
CP	CENTRIFUGAL PUMP
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FD	FLOOR DRAIN
DS	DOWNSPOUT (USE 4"Ø EMERALD PIPE)
CO	CLEANOUT
RCP	REINF. CONCRETE PIPE
VTR	VENT THRU ROOF
VTC	VENT THRU CEILING
FV	FLUSH VALVE
PB	PUSH BUTTON
WS	WASTE STACK
SS	SOIL STACK
VS	VENT STACK
CB	CATCH BASIN
MH	MANHOLE

SEVENTH FLOOR PLUMBING LAYOUT

SCALE 1:150M

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TIN NO. : 102 155 491 DATE ISSUED: 1-05-15

PROJECT : **PROPOSED STUDENT CENTER & EDUCATION COMPLEX**
LOCATION: C.M. RECTO AVENUE LAPASAN, CAGAYAN DE ORO CITY
OWNER : MINDANAO UNIVERSITY OF SCIENCE AND TECHNOLOGY

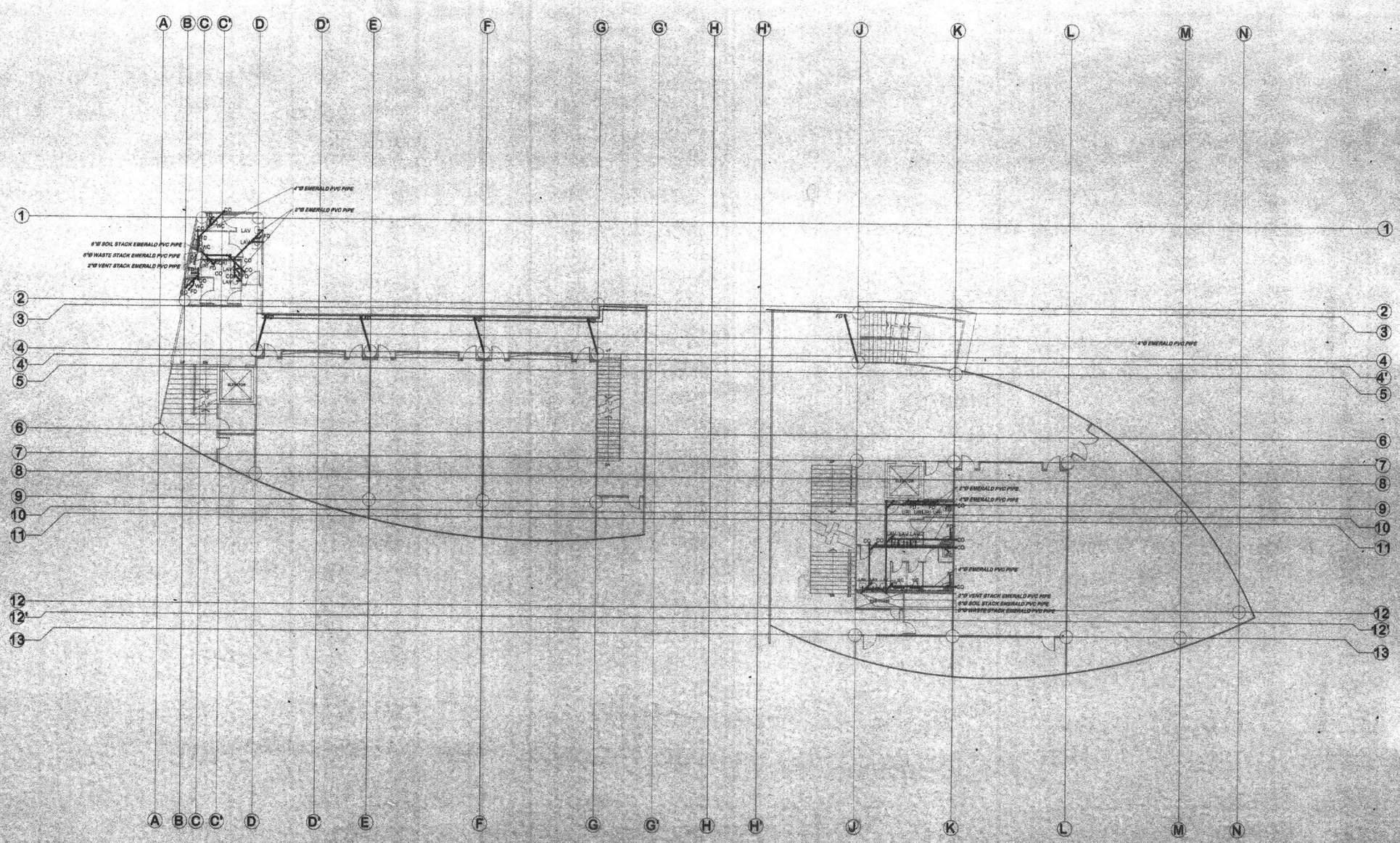
RECOMMENDING APPROVAL :
ATTY. JONATHAN S. OCHE
DIRECTOR, ADMINISTRATION

APPROVED :
DR. RICARDO E. ROTORAS
MUST PRESIDENT

SHEET TITLE: PLUMBING
SHEET CONTENTS :
SEVENTH FLOOR PLUMBING LAYOUT

SHEET NO.
P7
P24

138
198



SYMBOLS

- WC WATER CLOSET (LEGATO ELONGATED 6 LPF TOP-INLET FLUSH VALVE TYPE WATER CLOSET.)
- URI URINAL (SLOAN GEM 3.8 LPF FLUSH VALVE FITTINGS.)
- LAV LAVATORY (AVALON UNDERCOUNTER FAUCET-SQUARE LEVER HANDLE ON ROUND BODY, SINGLE HOLE ELONGATED BASIN MIKER SUPPLIED WITH PUSH BUTTON POP-UP ASSEMBLY.)
- GV GATE VALVE
- M MOTOR
- CP CENTRIFUGAL PUMP
- BP BOOSTER PUMP
- FD FLOOR DRAIN
- DS DOWNSPOUT (USE 4"Ø EMERALD PIPE)
- CO CLEANOUT
- RCP REINF. CONCRETE PIPE
- VTR VENT THRU ROOF
- VTC VENT THRU CEILING
- FV FLUSH VALVE
- PB PUSH BUTTON
- WS WASTE STACK
- SS SOIL STACK
- VS VENT STACK
- CB CATCH BASIN
- MH MANHOLE

SIXTH FLOOR PLUMBING LAYOUT

SCALE 1:150M

REPUBLIC OF THE PHILIPPINES
MINDANAO UNIVERSITY OF SCIENCE & TECHNOLOGY

C.M. Recto Avenue, Lapasan 9000 Cagayan de Oro City
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PRC NO. : 2332 PTR NO. : 2709982
TIN NO. : 192 155 491 DATE ISSUED: 1-05-16

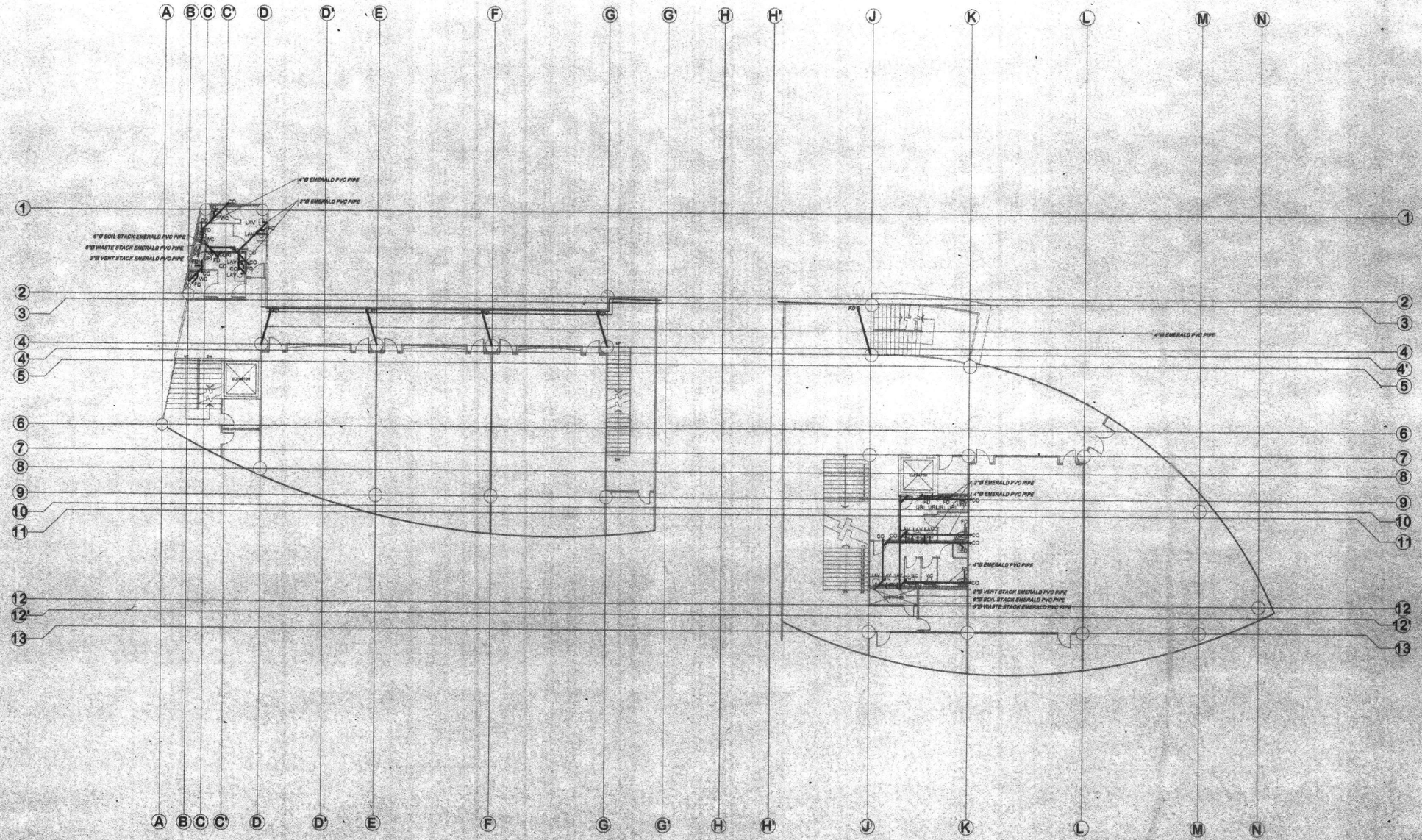
PROJECT : **PROPOSED STUDENT CENTER & EDUCATION COMPLEX**
LOCATION: C.M. RECTO AVENUE LAPASAN, CAGAYAN DE ORO CITY
OWNER : MINDANAO UNIVERSITY OF SCIENCE AND TECHNOLOGY

RECOMMENDING APPROVAL:
ATTY. JONATHAN S. OCHE
DIRECTOR, ADMINISTRATION

APPROVED:
DR. RICARDO E. ROTORAS
MUST PRESIDENT

SHEET TITLE: PLUMBING	SHEET NO.
SHEET CONTENTS: SIXTH FLOOR PLUMBING LAYOUT	P6 P24

137
198



SYMBOLS

WC	WATER CLOSET (LEGATO ELONGATED 6 LPF TOP-INLET FLUSH VALVE TYPE WATER CLOSET.)
URI	URINAL (SLOAN GEM 3.8 LPF FLUSH VALVE FITTINGS.)
LAV	LAVATORY (AVALON UNDERCOUNTER FAUCET-SQUARE LEVER HANDLE ON ROUND BODY, SINGLE HOLE ELONGATED BASIN MIXER SUPPLIED WITH PUSH BUTTON POP-UP ASSEMBLY.)
GV	GATE VALVE
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CP	CENTRIFUGAL PUMP
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RCP	REINF. CONCRETE PIPE
VTR	VENT THRU ROOF
VTC	VENT THRU CEILING
FV	FLUSH VALVE
PB	PUSH BUTTON
WS	WASTE STACK
SS	SOIL STACK
VS	VENT STACK
CB	CATCH BASIN
MH	MANHOLE

FIFTH FLOOR PLUMBING LAYOUT

SCALE 1:150M

REPUBLIC OF THE PHILIPPINES
MINDANAO UNIVERSITY OF SCIENCE & TECHNOLOGY

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TIN NO. : 192 155 491 DATE ISSUED: 1-05-15

PROJECT : **PROPOSED STUDENT CENTER & EDUCATION COMPLEX**

LOCATION: C.M. RECTO AVENUE LAPASAN, CAGAYAN DE ORO CITY
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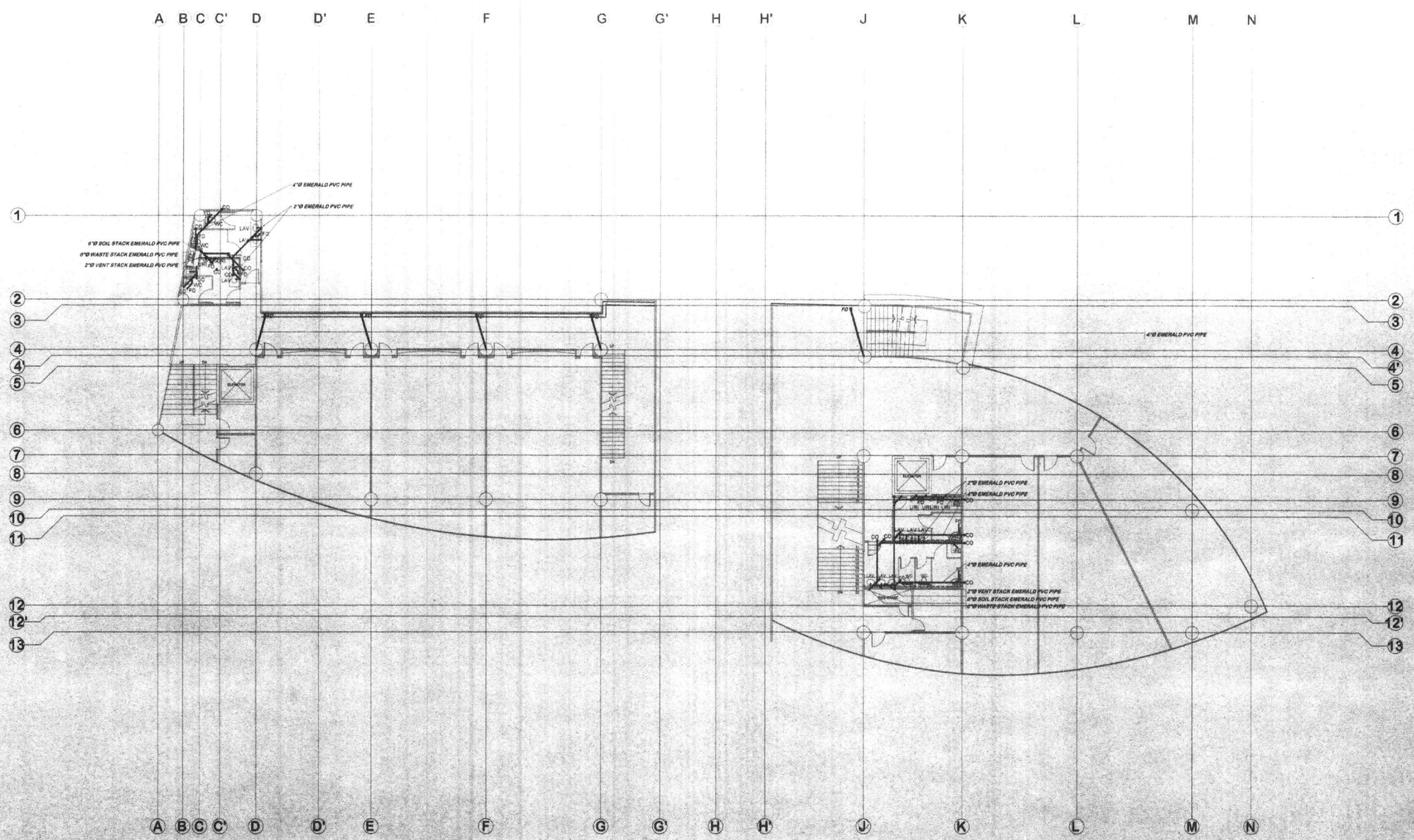
RECOMMENDING APPROVAL :

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DIRECTOR, ADMINISTRATION

APPROVED :

DR. RICARDO E. ROTORAS
MUST PRESIDENT

SHEET TITLE: PLUMBING	SHEET NO.
SHEET CONTENTS :	P5
FIFTH FLOOR PLUMBING LAYOUT	P24
	136
	198



SYMBOLS

WC	WATER CLOSET (LEGATO ELONGATED 6 LPF TOP-INLET FLUSH VALVE TYPE WATER CLOSET .)
URI	URINAL (SLOAN GEM 3.8 LPF FLUSH VALVE FITTINGS.)
LAV	LAVATORY (AVALON UNDERCOUNTER FAUCET-SQUARE LEVER HANDLE ON ROUND BODY, SINGLE HOLE ELONGATED BASIN MIXER SUPPLIED WITH PUSH BUTTON POP-UP ASSEMBLY.)
GV	GATE VALVE
M	MOTOR
CP	CENTRIFUGAL PUMP
BP	BOOSTER PUMP
FD	FLOOR DRAIN
DS	DOWNSPOUT (USE 4"Ø EMERALD PIPE)
CO	CLEANOUT
RCP	REINF. CONCRETE PIPE
VTR	VENT THRU ROOF
VTC	VENT THRU CEILING
FV	FLUSH VALVE
PB	PUSH BUTTON
WS	WASTE STACK
SS	SOIL STACK
VS	VENT STACK
CB	CATCH BASIN
MH	MANHOLE

FOURTH FLOOR PLUMBING LAYOUT

SCALE 1:150M

REPUBLIC OF THE PHILIPPINES
MINDANAO UNIVERSITY OF SCIENCE & TECHNOLOGY

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TIN NO. : 192 155 491 DATE ISSUED: 1-05-15

PROJECT : **PROPOSED STUDENT CENTER & EDUCATION COMPLEX**

LOCATION: C.M. RECTO AVENUE LAPASAN, CAGAYAN DE ORO CITY
OWNER : MINDANAO UNIVERSITY OF SCIENCE AND TECHNOLOGY

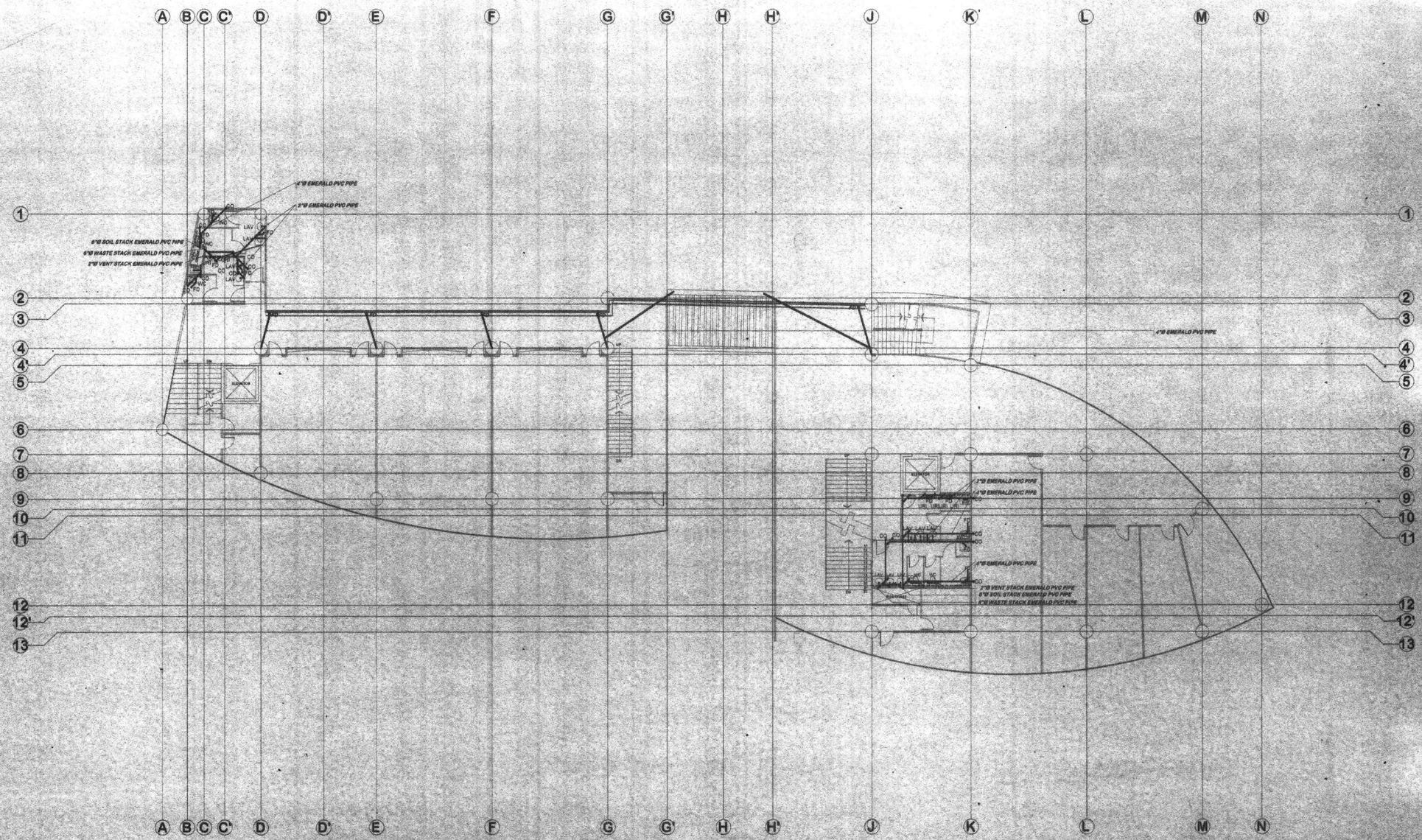
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SHEET TITLE: PLUMBING
SHEET CONTENTS :
FOURTH FLOOR PLUMBING LAYOUT

SHEET NO.
P4
P24

135
198



SYMBOLS

WC	WATER CLOSET (LEGATO ELONGATED 6 LPF TOP-INLET FLUSH VALVE TYPE WATER CLOSET)
URI	URINAL (6LOAN GEM 3.8 LPF FLUSH VALVE FITTINGS)
LAV	LAVATORY (AVALON UNDERCOUNTER FAUCET-SQUARE LEVER HANDLE ON ROUND BODY, SINGLE HOLE ELONGATED BASIN MIXER SUPPLIED WITH PUSH BUTTON POP-UP ASSEMBLY.)
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VTR	VENT THRU ROOF
VTC	VENT THRU CEILING
FV	FLUSH VALVE
PB	PUSH BUTTON
WS	WASTE STACK
SS	SOIL STACK
VS	VENT STACK
CB	CATCH BASIN
MH	MANHOLE

THIRD FLOOR PLUMBING LAYOUT

SCALE 1:150M

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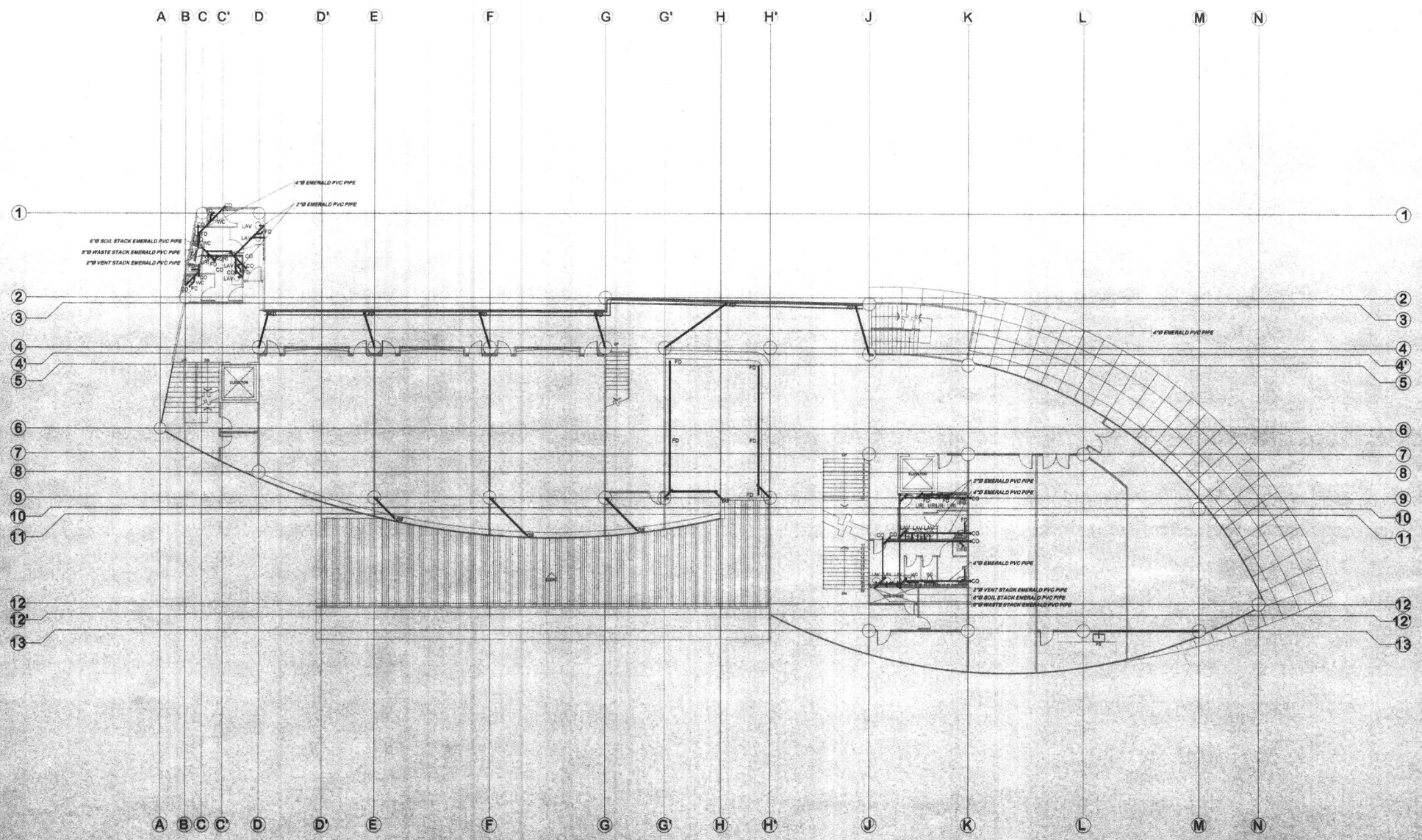
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SHEET TITLE: PLUMBING
SHEET CONTENTS :
THIRD FLOOR PLUMBING LAYOUT

SHEET NO.
P3
P24

134
198



SYMBOLS

WC	WATER CLOSET (LEGATO ELONGATED 6 LPF TOP-INLET FLUSH VALVE TYPE WATER CLOSET .)
URI	URINAL (SLOAN GEM 3.8 LPF FLUSH VALVE FITTINGS.)
LAV	LAVATORY (AVALON UNDERCOUNTER FAUCET-SQUARE LEVER HANDLE ON ROUND BODY, SINGLE HOLE ELONGATED BASIN MIXER SUPPLIED WITH PUSH BUTTON POP-UP ASSEMBLY.)
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VTC	VENT THRU CEILING
FV	FLUSH VALVE
PB	PUSH BUTTON
WS	WASTE STACK
SS	SOIL STACK
VS	VENT STACK
CB	CATCH BASIN
MH	MANHOLE

SECOND FLOOR PLUMBING LAYOUT

SCALE 1:150M

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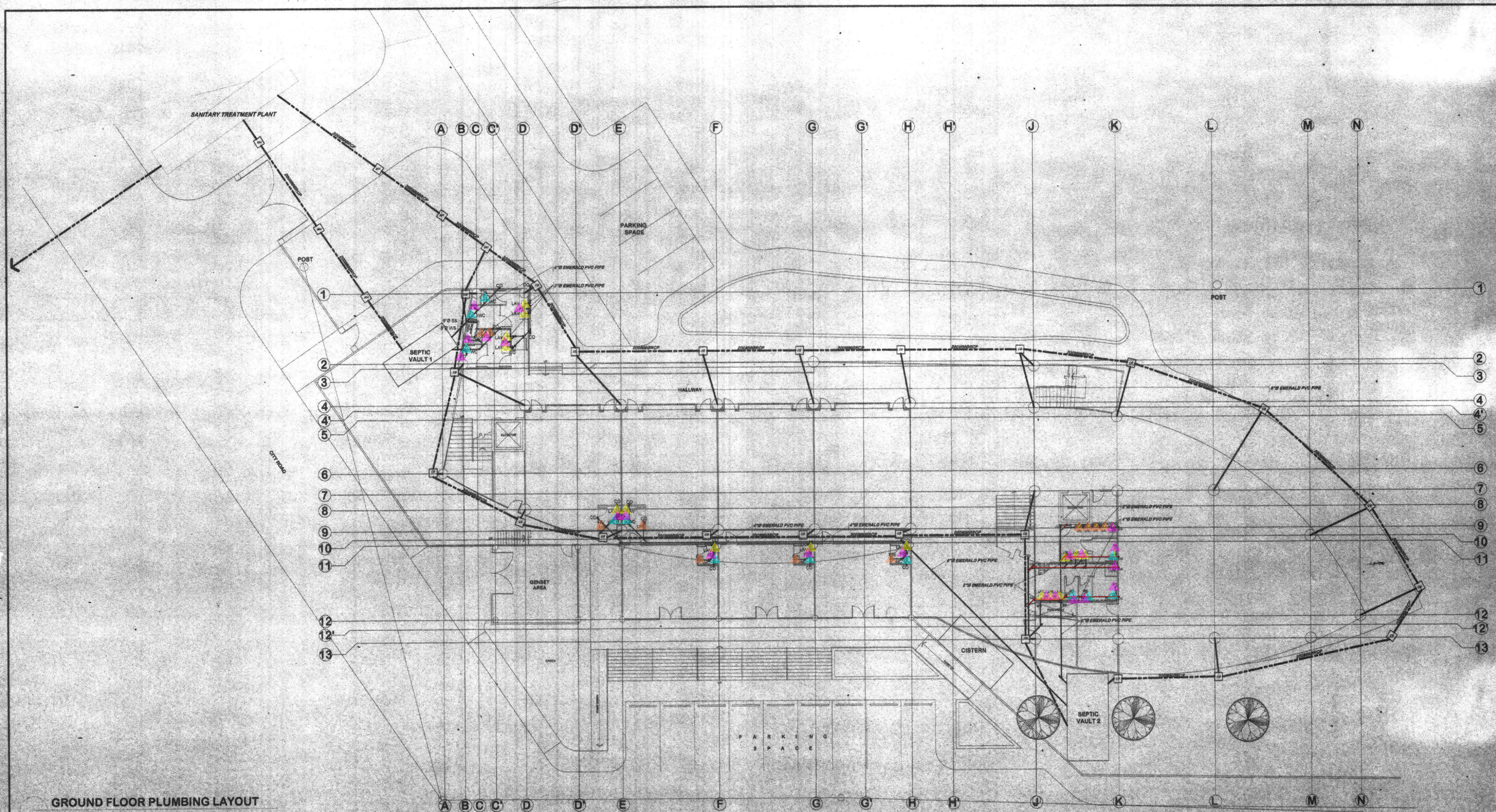
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SHEET TITLE: PLUMBING
SHEET CONTENTS : SECOND FLOOR PLUMBING LAYOUT
SHEET NO. P2 P24

128
198



GROUND FLOOR PLUMBING LAYOUT

SCALE 1:150M

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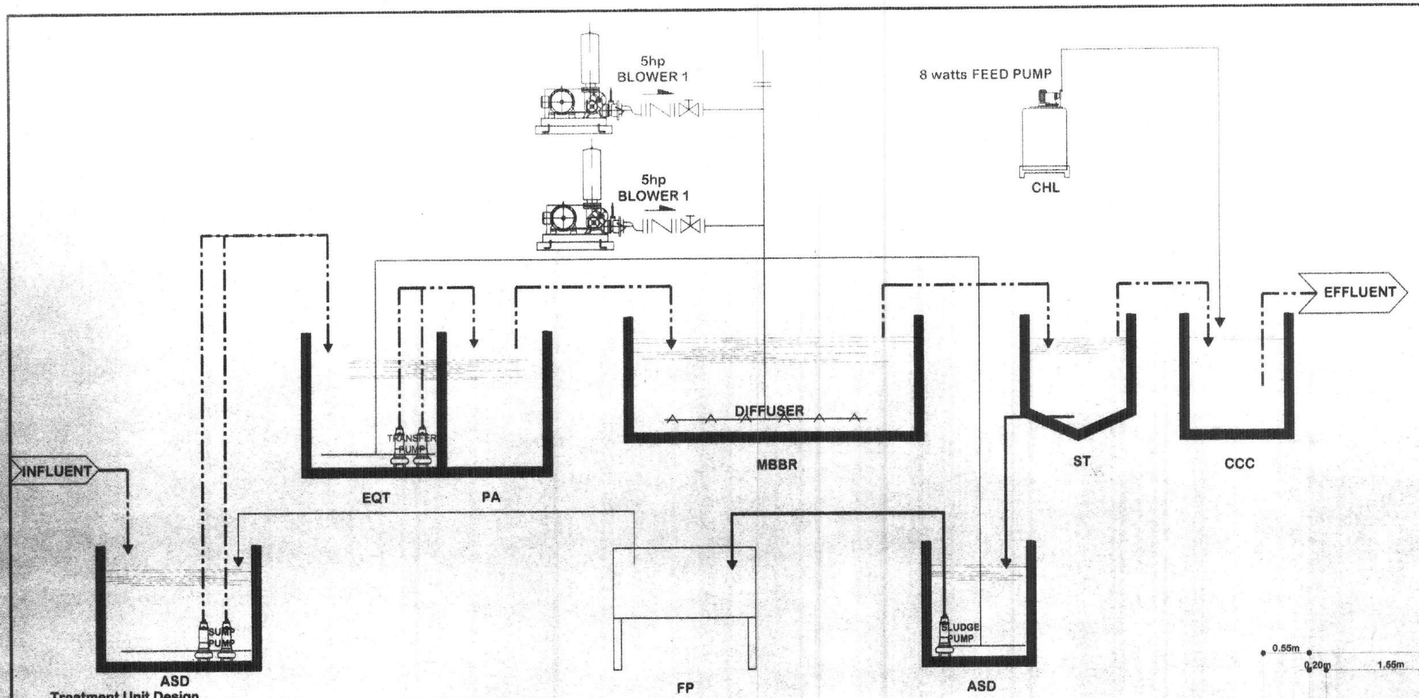
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SHEET TITLE: PLUMBING
SHEET CONTENTS :
GROUND FLOOR PLUMBING LAYOUT
SHEET NO. P1
P24
192
198



PROCESS FLOW DIAGRAM

NTS

PARAMETER	QUANTITY
Number of process trains	1
Number of MBBR reactors per train	2
Flow	1. Design Flow: 50m³/day
	2. Peak flow factor: 2

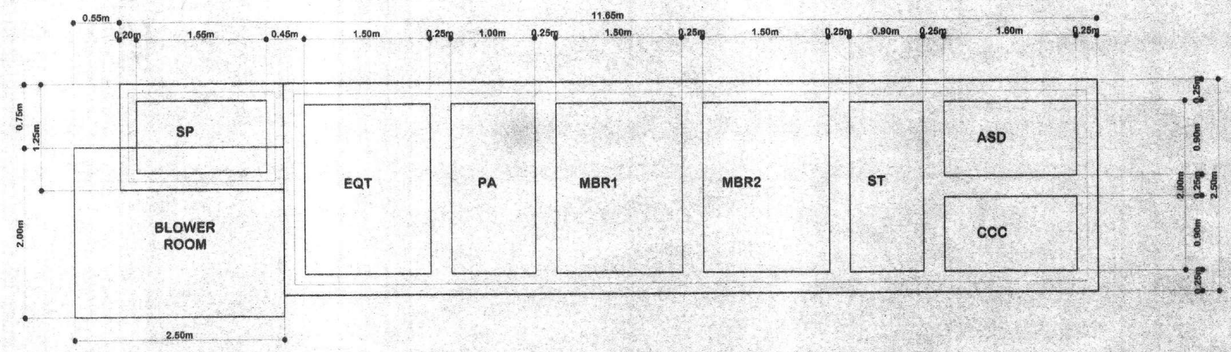
LEGEND:

- SP : SUMP PIT
- PA : PRE-AERATION TANK
- AT : AERATION TANK
- ST : SETTLING TANK
- MBBR : MOVING BED BIOFILM RESECTOR
- ASD : AEROBIC SLUDGE DIGESTER
- CCC : CHLORINE CONTACT CHAMBER
- FP : FILTER PRESS

PARAMETER	Influent	Final Effluent
BOD_5 (mg/l) design	300	
COD (mg/l)	600	80
TSS (mg/l)	300	60
TKN (mg/l) assumed		
NH3-N (Estimated) (mg/l)		
TP (mg/l)		
Temperature min/max (°C)	15-30	
pH (s.u.)	6.0-8.5	6.5-8.5

Treatment Unit Design.

EQUIPMENT	DESCRIPTION	QUANTITY
MBBR Reactor Tank 1 - BOD Oxidation		
Volume		6m³
Dimension	MBBR 1	2m x 1.5m x 3.0m
Areation Grid	Coarse bubble diffuser	70m³/hr @ 0.30 bar
Media	40% Fill fraction with ActiveCell920	2.4m³
Screens	To prevent media migration	One set
MBBR Reactor Tank 2 - BOD Polishing		
Volume		6m³
Dimension	MBBR 1	2m x 1.5m x 3.0m
Areation Grid	Coarse bubble diffuser	50m³/hr @ 0.30 bar
Media	40% Fill fraction with ActiveCell920	2.4m³
Screens	To prevent media migration	One set
Other details		
EQUALIZATION TANK		
Volume		6m³
Dimension	EQT	2m x 1.5m x 3.0m
Aeration Grid	Coarse bubble diffuser	40m³/hr @ 0.30 bar
PRE-AERATION TANK		
Volume		4m³
Dimension	PA	2m x 1m x 3.0m
Aeration Grid	Coarse bubble diffuser	4m³/hr @ 0.30 bar
CLARIFIER		
Volume		4m³
Blower Air Requirement		128m³/hr @ 0.30 bar



SANITARY TREATMENT PLANT

SCALE 1:40 m

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SHEET TITLE: PLUMBING
SHEET CONTENTS:
SANITARY TREATMENT PLANT PROCESS FLOW DIAGRAM

SHEET NO. P24 P24

155 198