HISTORIC DISTRICT COMMISSION
APPLICATION FOR WORK APPROVAL

City of Detroit - Planning & Development Department
2 Woodward Avenue, Suite 808
Detroit, Michigan 48226

APPLICATION ID
HDC2025-00107

PROPERTY INFORMATION

ADDRESS(ES): 14615 E. JEFFERSON AVE

HISTORIC DISTRICT: Jefferson-Chalmers Historic Business

SCOPE OF WORK: **(Check ALL that apply)**

- [x] Windows/ Doors
- [x] Walls/ Siding
- [x] Painting
- [x] Roof/Gutters/ Chimney
- [ ] Porch/Deck/Balcony
- [ ] Other
- [ ] Demolition
- [ ] Signage
- [ ] New Building
- [ ] Addition
- [ ] Site Improvements (landscape, trees, fences, patios, etc.)

BRIEF PROJECT DESCRIPTION:
The renovation project consists of interior renovations of an existing car wash and improvement to the building facade

APPLICANT IDENTIFICATION

TYPE OF APPLICANT: Architect/Engineer/Consultant

NAME: Adnan Al-Saati	**COMPANY NAME:** A&M CONSULTANTS		
ADDRESS: 835 MASON ST, Suite B290	**CITY:** DEARBORN	**STATE:** MI	**ZIP:** 48124
PHONE: +1 (313) 618-9335	**EMAIL:** aboled@yahoo.com		

I AGREE TO AND AFFIRM THE FOLLOWING:

- [x] I understand that the failure to upload all required documentation may result in extended review times for my project and/or a denied application.
- [x] I understand that the review of this application by the Historic District Commission does not waive my responsibility to comply with any other applicable ordinances including obtaining appropriate permits (building, sign, etc.) or other department approvals prior to beginning the work.
- [x] I hereby certify that the information on this application is true and correct. I certify that the proposed work is authorized by the owner of record and I have been authorized to make this application as the property owner(s) authorized agent.

DocuSigned by:
Adnan Al-Saati
AE563B952758485...
SIGNATURE

03/11/2025
DATE

NOTE: Based on the scope of work, additional documentation may be required. See www/detroitmi.gov/hdc **for scope-specific requirements.**

PROJECT DETAILS – TELL US ABOUT YOUR PROJECT

Instructions: Add project details using the text box in each section. If your details exceed the space provided, attach the details via the attachment icon for that section.

ePLANS PERMIT NUMBER:
(only applicable if you've already applied for permits through ePLANS) BLD-2025-00290

GENERAL

1. DESCRIPTION OF EXISTING CONDITION
Please tell us about the current appearance and conditions of the areas you want to change. You may use a few sentences or attach a separate prepared document on the right. (For example, "existing roof on my garage is covered in gray asphalt shingles in poor condition.")

The building roof is in poor condition and the there are some joint cracks in the exterior walls.

2. PHOTOGRAPHS
Help us understand your project. Please attach photographs of all areas where work is proposed.

3. DESCRIPTION OF PROJECT
In this box, tell us about what you want to do at the areas described above in box #1. (For example, Install new asphalt shingle roofing at garage.)

Install new roof, repair walls, remodel the interior, improve the facade

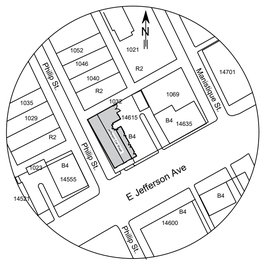
4. DETAILED SCOPE OF WORK
In this box, please describe all steps necessary to complete the work described in box #3. (For example, "remove existing shingles, replace wood deck as necessary, replace wood eaves, install roof vents, replace rotted fascia boards, paint, clean worksite.")

Install a new roof flat roof system to be supported on new beams and columns. repair, paint or install new veneer on all walls

5. BROCHURES/CUT SHEETS
Please provide information on the products or materials you are proposing to install. For example, a brochure on the brand and color of the shingles proposed.

ADDITIONAL DETAILS

6. WINDOWS/DOORS *Detailed photographs of window(s) and/or door(s) proposed for replacement showing the condition of the interior and exterior of the window(s) and/or door(s)*	



PROPOSED BUILDING RENOVATION FOR AN EXISTING CAR WASH

14615 E JEFFERSON AVENUE DETROIT,
MICHIGAN

PROJECT:
Renovation
Car Wash

LOCATION:
14615 E Jefferson Avenue
Detroit , Michigan

APPLICABLE CODES

BUILDING
MBC 2015 (MICHIGAN BUILDING CODE 2015)
EFFECTIVE APRIL 20, 2017
ACCESSIBILITY – ICCC ANSI A117.1–2009
PLUMBING
MPC 2021 (MICHIGAN PLUMBING CODE 2021)
MECHANICAL;
MMC 2021 (MICHIGAN MECHANICAL CODE 2021)
ELECTRICAL;
NEC 2023 (STATE OF MICHIGAN ELECTRICAL CODE)
2023 NATIONAL ELECTRICAL CODE WITH PART B AMENDMENTS
ENERGY
2015 (MICHIGAN ENERGY CODE)
FIRE
2015 (MICHIGAN FIRE CODE)

DESIGN PROFESSIONAL

A&M CONSULTANTS

835 MASON ST B290
DEARBORN, MI 48124
PH:(313)582-0022
FAX:(313)582-0028

SITE INFORMATION

PROPERTY DESCRIPTION(Parcel ID): 21000604
N--E JEFFERSON 1 W 11.84 FT 2 FOX CREEK SUB L25
P73 PLATS, W C R 21/295 45 X 125
PROPERTY DESCRIPTION(Parcel ID): 21000605
N--E JEFFERSON E 18.16 FT 2 3&4 FOX CREEK SUB L25
P73 PLATS, W C R 21/295 78.16 X 125

Building (1) Description:	Car Wash – One Story Commercial Building
Building(2) Description:	Detail Shop
Zoned :	B4
Size Property :	15395sq.ft = 0.353 acre(1acre=43560 ft^2)
Exist Gross Area :	5346 sq.ft
Proposed Gross Area:	4575 sq.ft
Flow of traffic line :	2898 sq.ft
Office:	128 sq.ft+= 4142 sq.ft
Mechanical :	144 sq.ft
Equipment :	698 sq.ft
Washing machine:	200 sq.ft
Bath:	74 sq.ft
Lot Coverage :	
Existing	33.77%
Proposed	29.75%

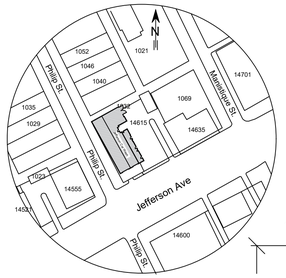
Building Height : Existing 12'/ Proposed 19'–6" feet &14'–9"
Occupancy/use classification: Use Group B Business
1person/100ft2= 2365.8/100=24 < 50 provide Min 2 Egress

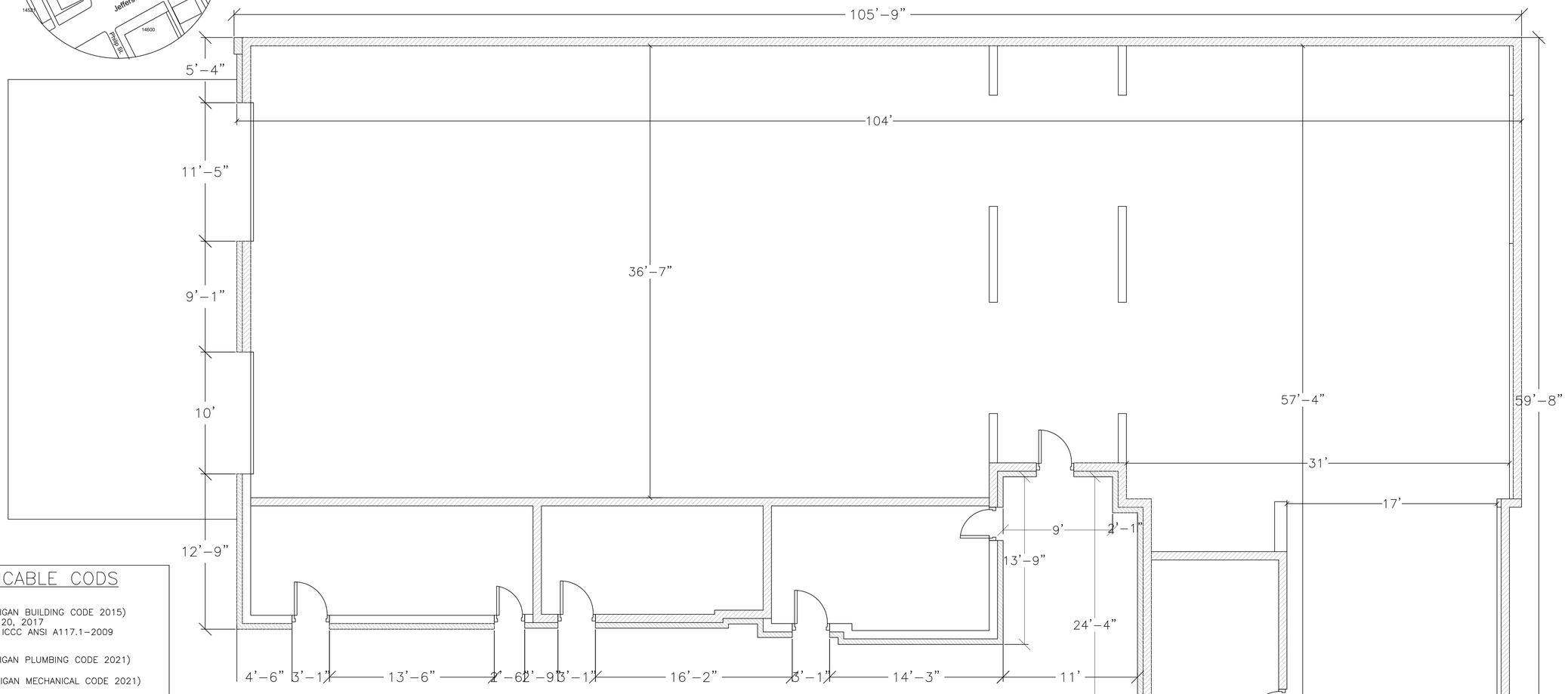
Construction type : Type III B – Construction (ext. wall non–combustible)
Sprinkler System : No
Parking : 1per/500ft^2 –Total parking spaces required=
4142x0.8 / 500= 7 Parking
Total parking spaces provided=7 include 1
Handicap (Min 1 H.C for 1–25 SPACES)
Building2Description : Detail Shop – Existing Area = 707 sq.ft

SHEET INDEX

STATE OF MICHIGAN
ADNAN H AL-SAATI
ENGINEER
No.
6201038925
LICENSED PROFESSIONAL ENGINEER

DATE: 02/05/2025			COVER SHEET
REV.: -/-/2025			





Existing Floor Plan

Scale : 1/4" = 1'-0"

APPLICABLE CODS

BUILDING
MBC 2015 (MICHIGAN BUILDING CODE 2015)
EFFECTIVE APRIL 20, 2017
ACCESSIBILITY – ICCC ANSI A117.1–2009

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MPC 2021 (MICHIGAN PLUMBING CODE 2021)
MECHANICAL:
MMC 2021 (MICHIGAN MECHANICAL CODE 2021)
FUEL GAS:
IFGC 2015 (INTERNATIONAL FUEL GAS CODE 2015)
ELECTRICAL:
NEC 2023 (STATE OF MICHIGAN ELECTRICAL CODE)
2023 NATIONAL ELECTRICAL CODE WITH PART B AMENDMENTS
REHAB:
MRCE 2015 (MICHIGAN REHABILITATION CODE FOR EXISTING BUILDING 2015)
FIRE CODE:
IFC 2015 (INTERNATIONAL FIRE CODE 2015), AS REFERANCED IN THE 2015 MICHIGAN BUILDING CODE

FIRE SUPPRESSION:
COMMERCIAL; NFPA 13 (2013)
FIRE ALARM:
COMMERCIAL; NFPA 72 (2013)

ENERGY CODE:
MBC 2015 (MICHIGAN BUILDING CODE 2015) – CHAPTER 13 &
MEC 2015 (MICHIGAN ENERGY CODE 2015) – CHPTERS 1 THROUGH 6 &
MICHIGAN ENERGY CODE, PART 10a, RULES (ANSI/ASHRAE/IES STANDARD 90.1–2013)

WALL LEGEND

- EXISTING MASONRY BLOCK WALL
- EXISTING MASONRY BRICK ON BLOCK WALL
- NEW METAL STUD WALL
- EXISTING PARTITION WALL STUDS 2X4”@16” W/5/8” Green Drywall

PROJECT:

Renovation
Car Wash

LOCATION:

14615 Jefferson Avenue
Detroit , Michigan

A & M CONSULTANTS

835 MASON,STE. B290
DEARBORN, MI-48124
PH:(313) 582-0022
FAX:(313) 582-0028

DRAWN BY:
Ahmad Habli

APPROVED BY:
ADNAN AL-SAATI

SUBMITTALS

REVISIONS:

PROJECT NO
25-102
DATE
02/05/2025
SCALE
NOTED

SHEET TITLE
EXISTING FLOOR PLAN

A-01

SEAL

STATE OF MICHIGAN
ADNAN H AL- SAATI
ENGINEER
No.
6201038105
PROFESSIONAL ENGINEER

PROPERTY DESCRIPTION(Parcel ID): 21000604
N--E JEFFERSON 1 W 11.84 FT 2 FOX CREEK SUB L25
P73 PLATS, W C R 21/295 45 X 125
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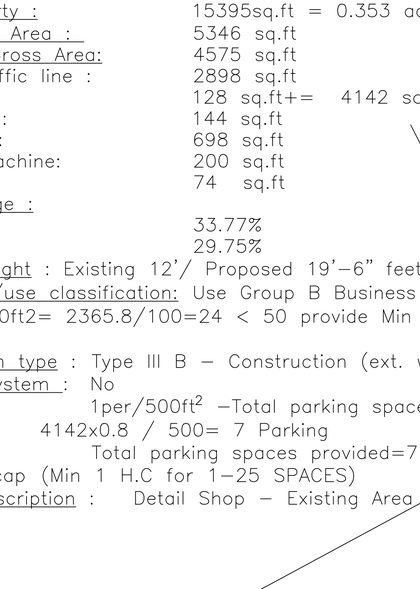
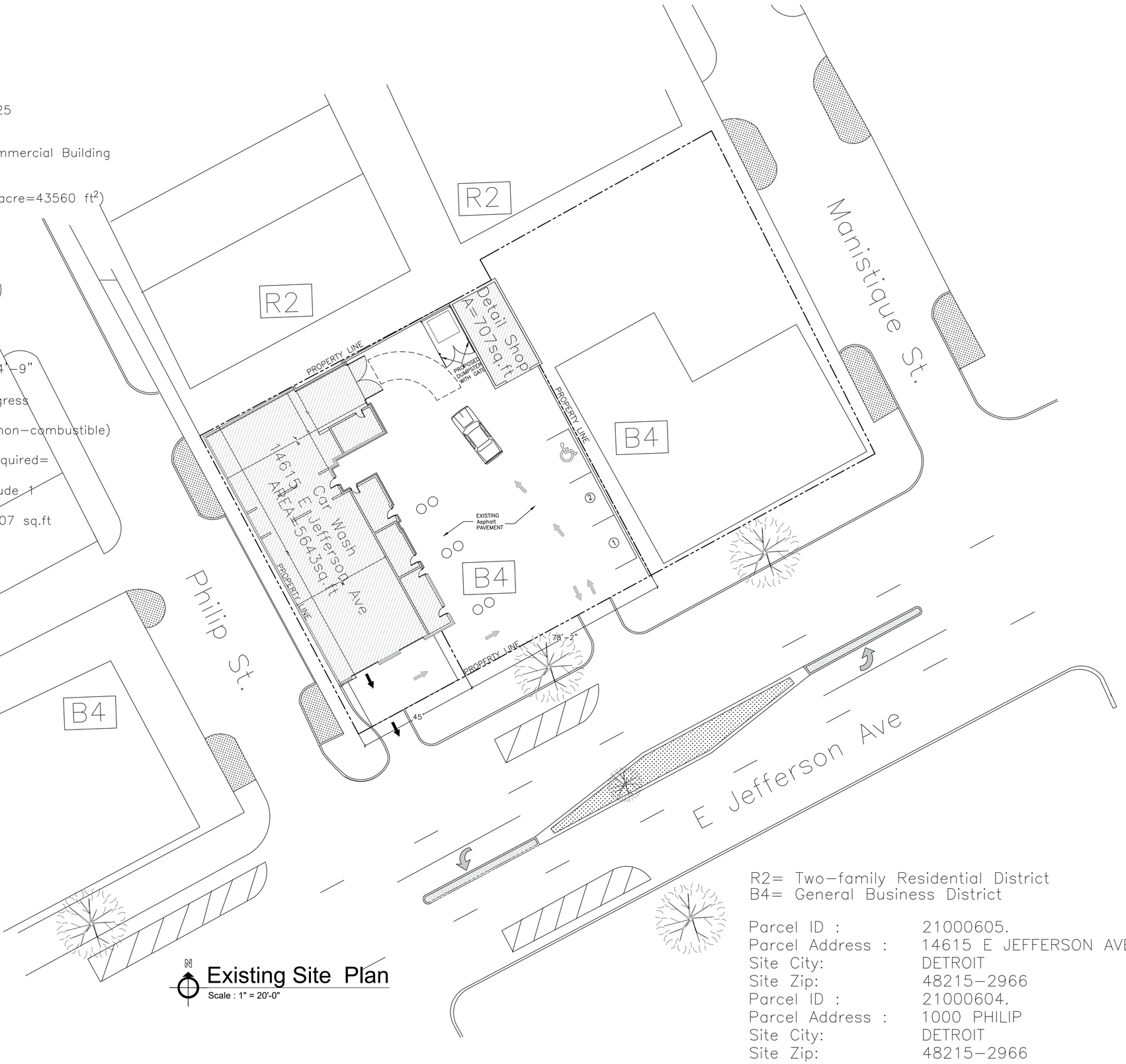


DUMPSTER DETAIL



N
Existing Site Plan
Scale : 1" = 20'-0"

R2= Two-family Residential District
B4= General Business District

Parcel ID :	21000605.
Parcel Address :	14615 E JEFFERSON AVE
Site City:	DETROIT
Site Zip:	48215-2966
Parcel ID :	21000604.
Parcel Address :	1000 PHILIP
Site City:	DETROIT
Site Zip:	48215-2966

PROJECT:
Renovation
Car Wash

LOCATION:
14615 Jefferson Avenue
Detroit , Michigan

A & M CONSULTANTS
835 MASON,STE. B290
DEARBORN, MI-48124
PH:(313) 582-0022
FAX:(313) 582-0028

DRAWN BY:
Ahmad Habli

APPROVED BY:
ADNAN AL-SAATI

SUBMITTALS

REVISIONS:

PROJECT NO
25-102
DATE
02/05/2025
SCALE
NOTED
SHEET TITLE
EXISTING SITE PLAN

A-02

SEAL
STATE OF MICHIGAN
ADNAN H AL-SAATI
ENGINEER
No. 6201038105
LICENSED PROFESSIONAL ENGINEER

PROPERTY DESCRIPTION(Parcel ID): 21000604
N--E JEFFERSON 1 W 11.84 FT 2 FOX CREEK SUB L25
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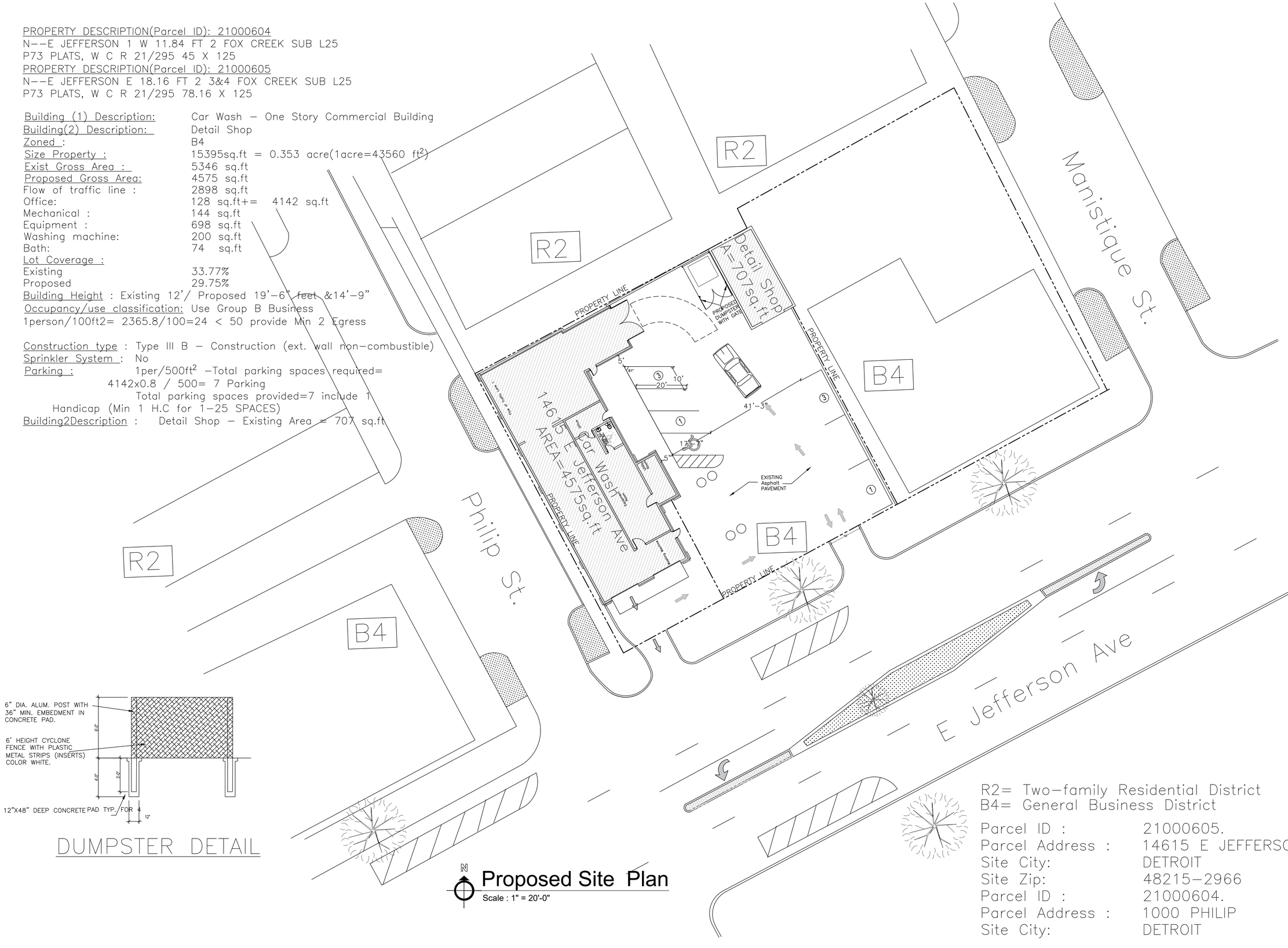

DUMPSTER DETAIL

N
Proposed Site Plan
Scale : 1" = 20'-0"

R2= Two-family Residential District
B4= General Business District

Parcel ID :	21000605.
Parcel Address :	14615 E JEFFERSON AVE
Site City:	DETROIT
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PROJECT:
Renovation
Car Wash

LOCATION:
14615 Jefferson Avenue
Detroit , Michigan

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FAX:(313) 582-0028

DRAWN BY:
Ahmad Habli

APPROVED BY:
ADNAN AL-SAATI

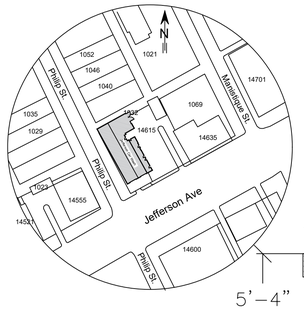
SUBMITTALS

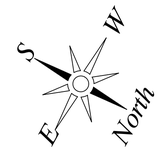
REVISIONS:

PROJECT NO
25-102
DATE
02/05/2025
SCALE
NOTED
SHEET TITLE
PROPOSED SITE PLAN

A-03

SEAL
STATE OF MICHIGAN
ADNAN H AL-SAATI
ENGINEER
No. 6201038125
REGISTERED PROFESSIONAL ENGINEER





105’–1”

104’

5’–4”

11’–5”

9’–1”

10’

12’–9”

36’–7”

34’–3”

57’–4”

59’–8”

31’

17’

24’–4”

19’–7”

19’

11’

12’–3”

17’–2”

1’–2”

SAW CUT REMOVE EXISTING PARTITION
FULL HEIGHT&BRICK WALL.
REMOVE METAL DOOR AND FRAME

SAW CUT REMOVE EXISTING
MASONRY BLOCK FULL HEIGHT.
REMOVE METAL DOOR AND FRAME

Demolition Floor Plan

Scale : 1/4" = 1'-0"

WALL LEGEND

- EXISTING MASONRY BLOCK WALL
- EXISTING MASONRY BRICK ON BLOCK WALL
- REMOVE, EXISTING MASONRY BLOCK WALL
- REMOVE, EXISTING MASONRY BRICK ON BLOCK WALL
- REMOVE, EXISTING MASONRY BRICK WALL AND EXISTING PARTITION

PROJECT:

Renovation
Car Wash

LOCATION:

14615 Jefferson Avenue
Detroit , Michigan

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DRAWN BY:
Ahmad Habli

APPROVED BY:
ADNAN AL-SAATI

SUBMITTALS

REVISIONS:

PROJECT NO
25-102

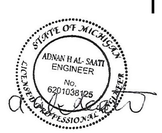
DATE
02/05/2025

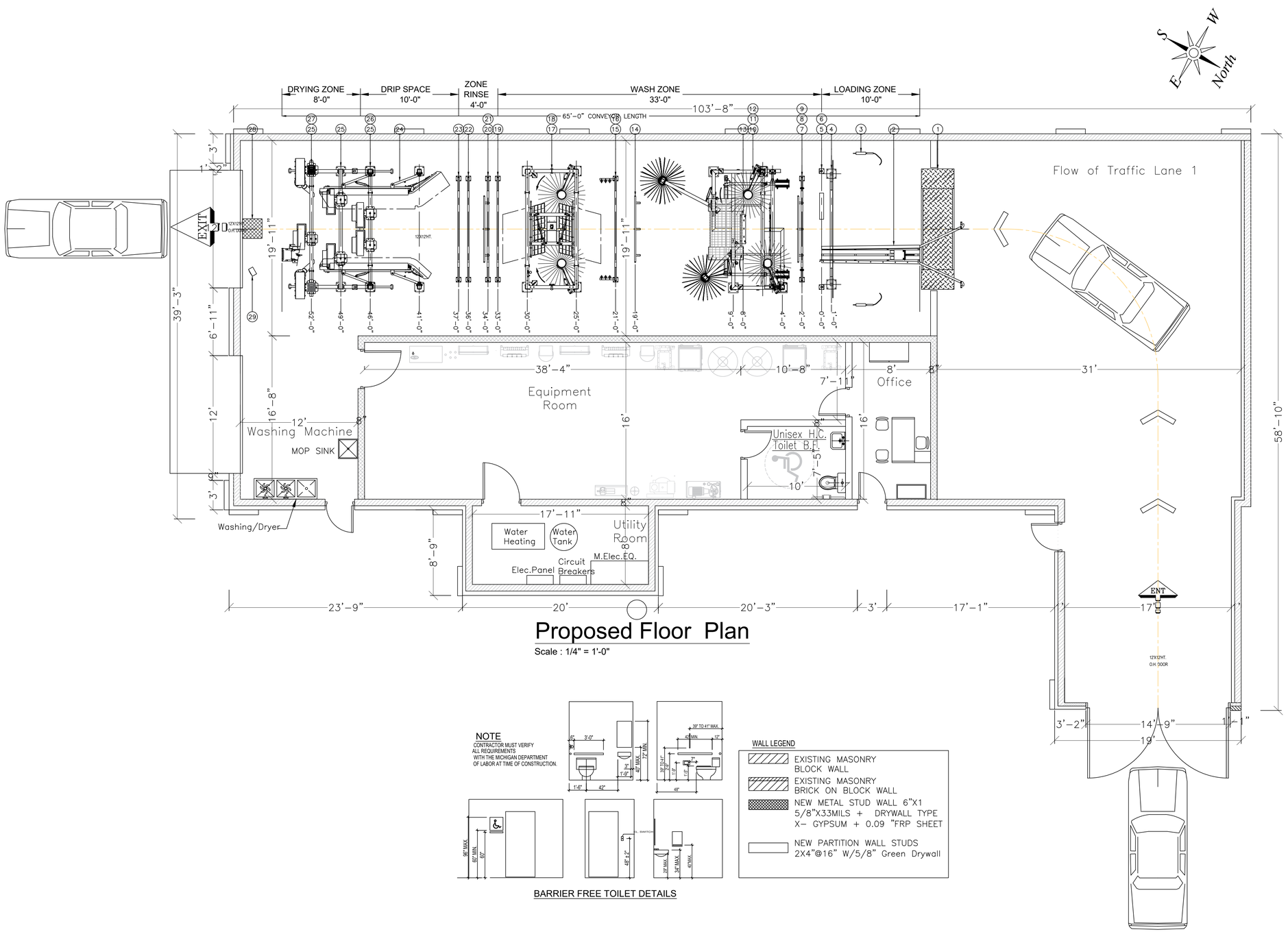
SCALE
NOTED

SHEET TITLE
DEMOLITION FLOOR PLAN

A-04

SEAL





Proposed Floor Plan

Scale : 1/4" = 1'-0"

BARRIER FREE TOILET DETAILS

PRIMARY EQUIPMENT

1. C-3D CORRELATOR
2. 65' CONVEYOR LENGTH
3. DUAL PREP GUNS
4. ULTIMATE GRAND ENTRY ARCH
5. ENTRY EYES
6. ELECTRONIC SENSOR PAD
7. ECONO ARCH – PRESOAK
8. RAIN OF FOAM – PRESOAL
9. CTA – FOAMING TIRE & WHEEL APPLICATOR
10. SHORT STACK FLEX WRAP
11. TOP BRUSH ATTACHMENT /SHORT STACK
12. H.C.R.P. 21"
13. UNDERCARRIAGE APPLICATOR
14. (3) ROW RAIN MANIFOLD
15. 2x2 ARCH – RAIN OF FOAM – WAX
16. TRIPLE FOAM APPLICATOR
17. HANNA FINISHING TOUCH MITTER
18. H.C.R.P. 28"
19. ECONO ARCH – RINSE
20. ECONO ARCH – CLEAR COAT
21. (1) ROW DRYING AGENT
22. ECONO ARCH – CERAMIC
23. ECONO ARCH – SPOT FREE
24. HANNA TIRE GLAZE APPLICATOP
25. 7 AIR DRYERS
26. DUAL NOZZLE
27. SPIDER FIN NOZZLE /PAIR
28. COLLISION AVOIDANCE PAD
29. WAIT / GO EXIT TRAFFIC LIGH

PROJECT:

Renovation
Car Wash

LOCATION:

14615 Jefferson Avenue
Detroit , Michigan

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DRAWN BY:
Ahmad Habli

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ADNAN AL-SAATI

SUBMITTALS

REVISIONS:

PROJECT NO
25-102

DATE
02/05/2025

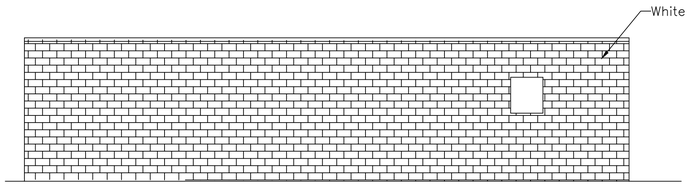
SCALE
NOTED

SHEET TITLE

PROPOSED FLOOR PLAN
W/ Equipments

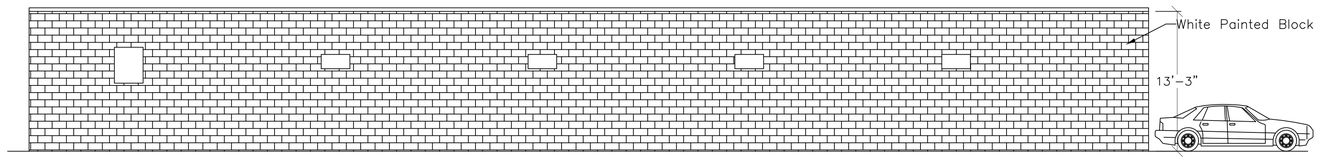
A-05

SEAL



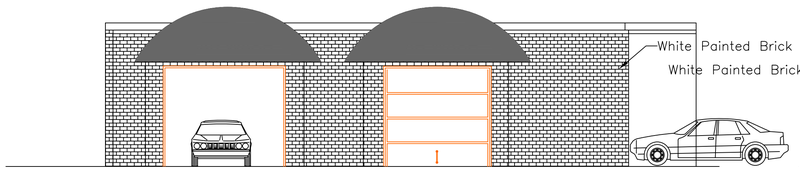
Existing North Elevation

Scale : 1/4" = 1'-0"



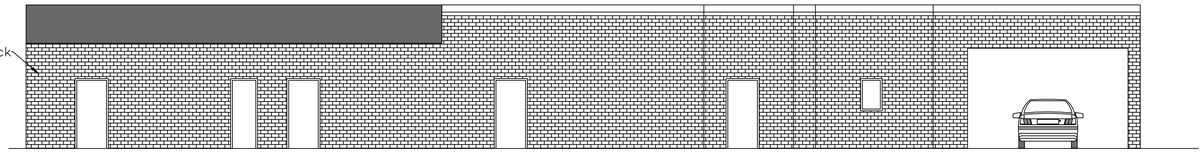
Existing West Elevation

Scale : 1/4" = 1'-0"



Existing South Elevation

Scale : 1/4" = 1'-0"



Existing East Elevation

Scale : 1/4" = 1'-0"

PROJECT:

Renovation
Car Wash

LOCATION:

14615 Jefferson Avenue
Detroit , Michigan

A & M
CONSULTANTS

835 MASON,STE. B290
DEARBORN, MI-48124
PH:(313) 582-0022
FAX:(313) 582-0028

DRAWN BY:

Ahmad Habli

APPROVED BY:

ADNAN AL-SAATI

SUBMITTALS

REVISIONS:

PROJECT NO
25-102

DATE
02/05/2025

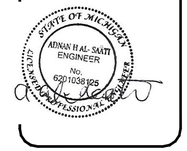
SCALE
NOTED

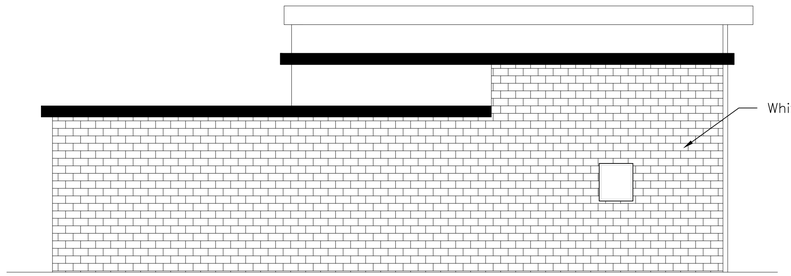
SHEET TITLE

EXISTING ELEVATIONS

A-06

SEAL





Proposed North Elevation

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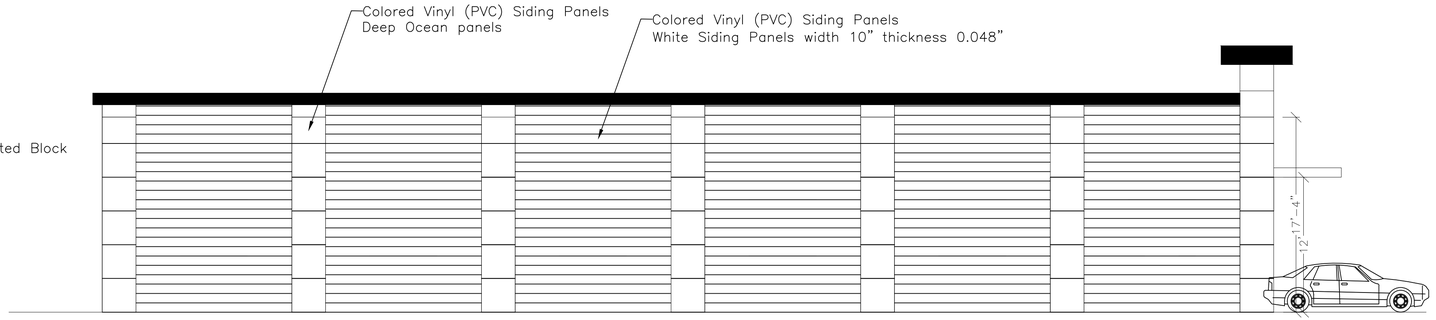
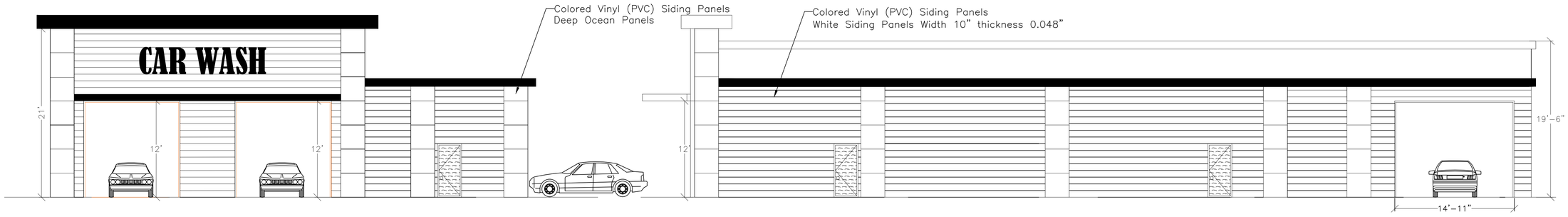


Proposed Elevation

Scale : 1/4" = 1'-0"

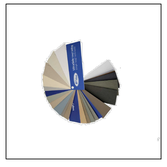


Proposed South Elevation

Scale : 1/4" = 1'-0"

Proposed East Elevation

Scale : 1/4" = 1'-0"



Specification of Colored Vinyl (PVC) Siding Panels

1. General Material Properties
Material: Polyvinyl Chloride (PVC)
Composition: UV-stabilized, impact-resistant vinyl with added color pigmentation
Finish: Smooth or wood-grain texture, pre-colored (no painting required)
Color Options: Navy Blue, Pacific Blue, Royal Blue, Deep Ocean Blue (varies by manufacturer)

2. Panel Dimensions & Thickness
Panel Width: 10"
Panel Length: 8', 10', 12', 16', 20' (Custom sizes available)
Thickness: 0.048"
Locking System: Interlocking or tongue-and-groove panels

3. Durability & Performance Ratings
Weather Resistance: Withstands extreme temperatures (-40°F to 140°F)
Waterproof & Mold-Resistant: Yes, does not absorb moisture
UV Protection: Yes, fade-resistant with built-in UV inhibitors
Impact Resistance: Moderate (ASTM D4226 compliant)
Fire Rating: Class A or B (ASTM E84)
Wind Load Resistance: 110 – 160 mph (varies by manufacturer)

4. Installation & MaintenanceInstallation Method:
Nailed, clipped, or fastened to furring strips or sheathingMaintenance:
Easy to clean with soap & water or pressure washer
No need for painting or sealing
Resistant to rust, corrosion, and rot5.

PROJECT:

Renovation
Car Wash

LOCATION:

14615 Jefferson Avenue
Detroit , Michigan

A & M CONSULTANTS

835 MASON,STE. B290
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DRAWN BY:
Ahmad Habli

APPROVED BY:
ADNAN AL-SAATI

SUBMITTALS

REVISIONS:

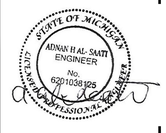
PROJECT NO
25-102
DATE
02/05/2025
SCALE
NOTED

SHEET TITLE

PROPOSED ELEVATIONS

A-07

SEAL



1- DEAD LOADS:
SINGLE PLY RUBBER ROOFING2 PSF
RIGID INSULATION 1.5" 1 PSF
20 GA METAL DECK 1.5" 2 PSF
OWN WEIGHT TRUSS 6 PSF

2- LIVE LOAD : 20 PSF

3- SNOW LOAD : 30 PSF

4- WIND UPLIFT: 15 PSF

5- MECHANICAL EQ. AVR.: 900 LB

TOTAL LOAD COMBINATION :
= D+L+S+0.75W=11+20+30+0.75x15= 72.24~=75PSF

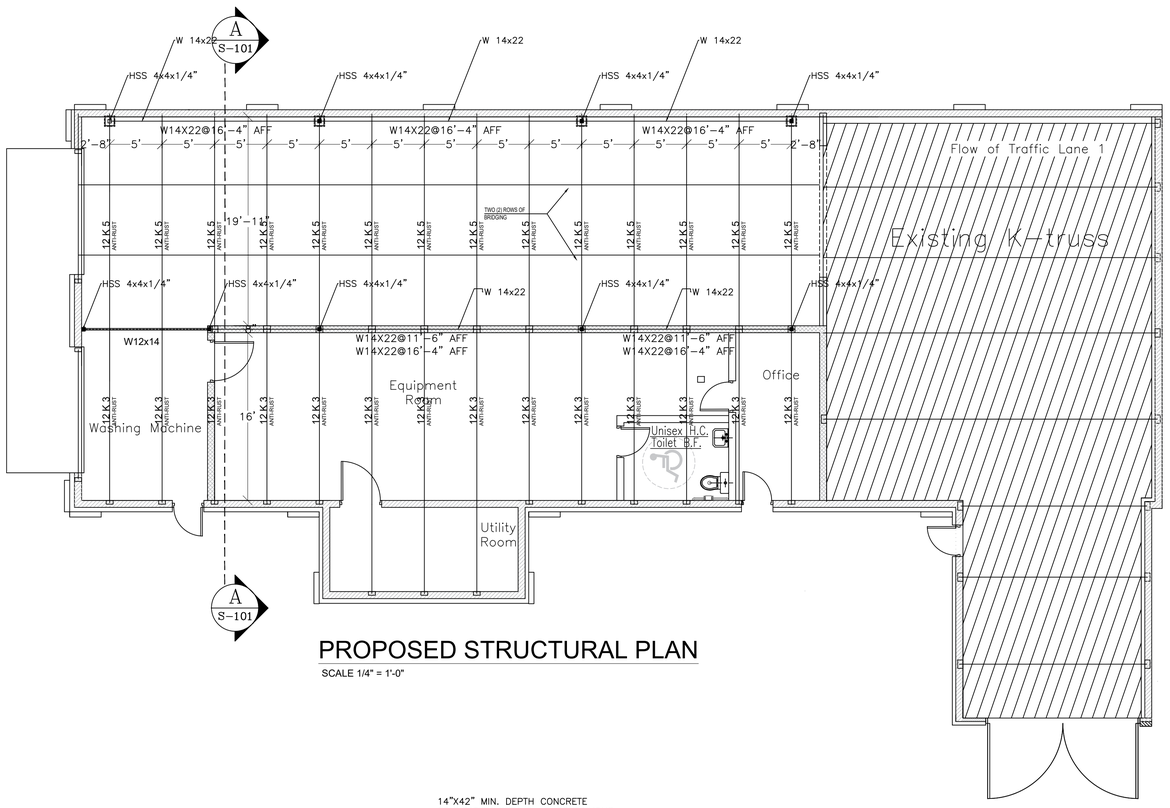
FOR TRUSS JOIST SPACING 5 FEET
W=75X5=375 PLF

FROM TABLE ASD SERIES K --- FOR SPAN 20 FEET WE GET :
12K5

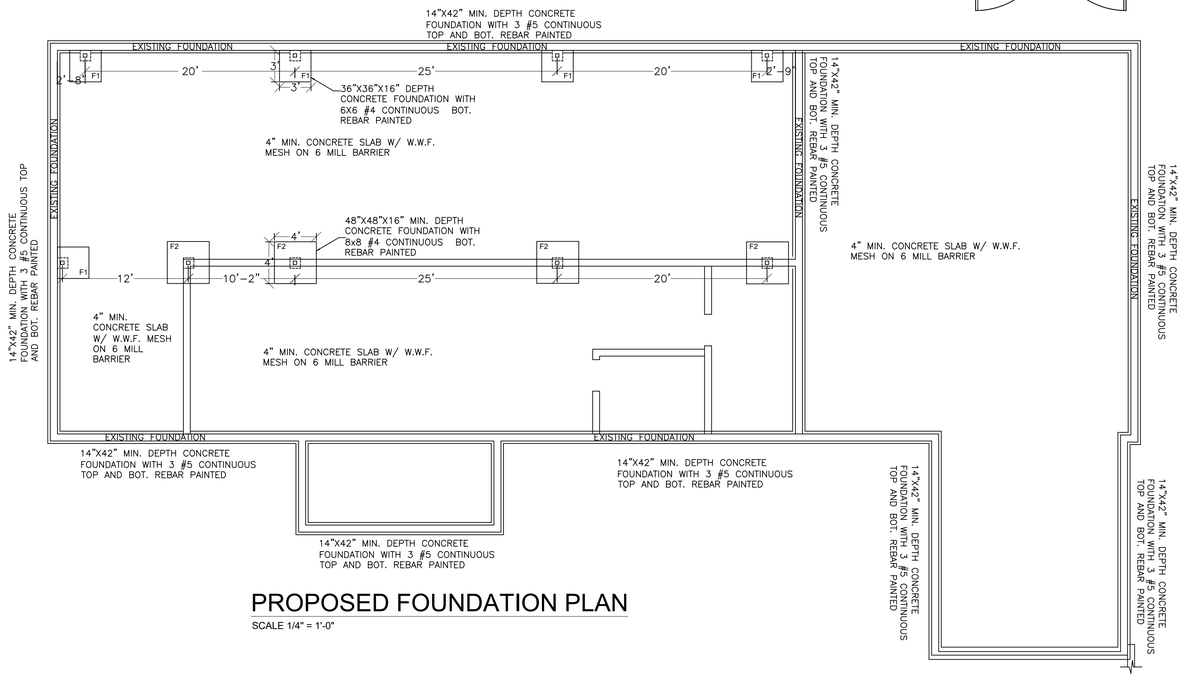
FOR SPAN 16 FEET W/MECHANICAL EQUIPMENT
TL=475 PLF --- WE GET : 12K3

FROM TABLE ASD SERIES K --- FOR SPAN 28 FEET WE GET :
16K9

1. PROVIDE TEMPORARY BRACING AS REQUIRED TO INSURE THE STABILITY OF THE STRUCTURE UNTIL THE PERMANENT FRAMING IS IN PLACE. VERIFY EXACT SIZE AND LOCATION OF ALL FLOOR AND ROOF OPENINGS WITH MECHANICAL AND PLUMBING CONTRACTOR. STEEL CONTRACTOR TO PROVIDE PROPER STRUCTURAL SUPPORTS FOR HVAC UNITS, FANS, ETC. , COORDINATE WITH MECHANICAL CONTRACTOR. REFER TO OTHER DRAWINGS FOR MISCELLANEOUS STEEL ANGLES, BARS, PLATES, ETC., ATTACHED TO STRUCTURAL STEEL.
2. THE STRUCTURAL INTEGRITY OF THE BUILDING SHOWN ON THESE PLANS IS DEPENDENT UPON THE COMPLETION ACCORDING TO PLANS AND SPECIFICATIONS. STRUCTURAL MEMBERS ARE NOT SELF BRACING UNTIL PERMANENTLY AFFIXED TO THE STRUCTURE AS DIRECTED. THE ENGINEER/ ARCHITECT ASSUME NO LIABILITY FOR THE STRUCTURE DURING CONSTRUCTION UNLESS THE CONSTRUCTION METHOD OF BRACING ARE INCLUDED IN THE PLANS AND SPECIFICATIONS OR ARE SUPERVISED THE ENGINEER/ ARCHITECT DURING CONSTRUCTION.



PROPOSED STRUCTURAL PLAN
SCALE 1/4" = 1'-0"



PROPOSED FOUNDATION PLAN
SCALE 1/4" = 1'-0"

STEEL NOTES

1- THE FOLLOWING LOADS WERE USED IN THE DESIGN: SNOW LOAD = 30 P.S.F., WITH ADJUSTMENTS FOR ROOF HEIGHTS. WIND LOAD BASED ON 115 M.P.H. WIND SPEED AND BOCA LATEST EDITION.
2- ALL STRUCTURAL STEEL SHALL CONFORM TO THE LATEST ASTM SERIAL DESIGNATION, ROLLED SHAPES- ASTM A 36, TUBING- ASTM A500 GRADE B OR C, FY = 46 K.S.I. ALL STEEL TO HAVE ONE SHOP COAT OF RUST INHIBITIVE PAINT, STEEL DESIGN, FABRICATION AND ERICTION IS TO BE INACCORDANCE WITH THE LATEST A.I.S.C. AND A.W.S. SPECIFICATIONS.
3- ALL FIELD CONNECTIONS TO BE MADE WITH ASTM 325- 3/4" DIA. H.S. BOLTS OR EQUIVALENT WELDS. SHOP CONNECTION TO BE WELDED ASTM A233 CLASS E70 ELECTRODES IN ACCORDANCE WITH A.I.S.C. AND A.W.S. SPECIFICATIONS.
4- STEEL JOISTS TO BE FABRICATED BY MEMBER OF STEEL JOIST INSTITUTE AND ERECTED IN ACCORDANCE WITH THE LATEST SPECIFICATION. STEEL JOISTS BEARING ON STEEL BEAM OR PLATES, TO BE WELDED TO STEEL WITH 2" LONG BEAD ON EACH SIDE OF BEARING. EXTEND BOTTOM CHORD OF JOISTS AT COLUMNS AND CONNECT. ANY EQUIPMENT SUSPENDED FROM STEEL JOISTS SHALL BE FROM THE TOP CHORD OF PANEL POINTS. VERIFY ALLOWABLE LOADS WITH THE STEEL JOIST INSTITUTE.
5- ROOF DECK TO BE 1 1/2", 20GA.. PAINTED METAL, THREE SPAN UNITS WITH FY= 33 K.S.I.
6- ALL WALL BEARING STEEL BEAMS AND LINTELS TO BEAR A MINIMUM ** ON 3-COURSES HIGH BY 2' - 8" WIDE SOLID MASONRY, TYPE N MORTAR, WITH TWO 3/4" DIA. ANCHOR BOLTS, ASTM A 325, AT EACH END UNLESS OTHERWISE NOTED.
7- PROVIDE TEMPORARY BRACING AS REQUIRED TO INSURE THE STABILITY OF THE STRUCTURE UNTIL THE PERMANENT FRAMING IS IN PLACE. VERIFY EXACT SIZE AND LOCATION OF ALL FLOOR AND ROOF OPENINGS WITH MECHANICAL AND PLUMBING CONTRACTOR. STEEL CONTRACTOR TO PROVIDE PROPER STRUCTURAL SUPPORTS FOR HVAC UNITS, FANS, ECT. , COORDINATE WITH MECHANICAL CONTRACTOR. REFER TO OTHER DRAWINGS FOR MISCELLANEOUS STEEL ANGLES, BARS, PLATES, ECT., ATTACHED TO STRUCTURAL STEEL.
8- THE STRUCTURAL INTEGRITY OF THE BUILDING SHOWN ON THESE PLANS IS DEPENDENT UPON THE COMPLETION ACCORDING TO PLANS AND SPECIFICATIONS. STRUCTURAL MEMBERS ARE NOT SELF BRACING UNTIL PERMANENTLY AFFIXED TO THE STRUCTURE AS DIRECTED. THE ENGINEER/ ARCHITECT ASSUME NO LIABILITY FOR THE STRUCTURE DURING CONSTRUCTION UNLESS THE CONSTRUCTION METHODE OF BRACING ARE INCLUDED IN THE PLANS AND SPECIFICATIONS OR ARE SUPERVISED THE ENGINEER/ ARCHITECT DURING CONSTRUCTION.

CONCRETE NOTES:-

1- FOOTINGS ARE DESIGNED FOR A SOIL BEARING PRESSURE OF 2500 PSF.
2- ALL CONCRETE SLABS, FOOTINGS, FOUNDATION WALLS AND PIERS SHALL DEVELOPE A COMPRESSIVE CONCRETE STRENGTH OF 3500 PSI @ 28 DAYS, WITH 6%, +/-1% ENTRAINED AIR WHERE EXPOSED TO WEATHER. CONCRETE WORK AND PLACEMENT SHALL CONFORM TO THE SPECIFICATIONS OF THE ACI LATEST ADDITION. ALL FILL UNDER SLAB SHALL BE 4" MIN.CLEAN GRANULAR SAND COMPACTED TO A MINIMUM OF 95% MODIFIED PROCTOR.
3- ALL FABRICATION AND ERECTION OF REINFORCED BARS SHALL FOLLOW THE ACI MANUAL "STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES" ACI 315 LATEST A 318). REINFORCING BARS ARE TO BE INTERMEDIATE GRADE, PERFORMED, NEW BILLET STEEL MEETING ASTM A15 (LATEST EDITION). ASTM A615 GRADE 60. ALL REINFORCING STEEL SHALL HAVE A MINIMUMM 36 BAR DIAMETER LAP. WELDED WIRE FABRIC MUST HAVE END LAPS OF ONE FULL MESH AND CONFORM TO ASTM A185-75.
4- PROVIDE (4) #5 CORNER BARS (2'-0" X 2'-0") AT ALL INTERSECTIONS AND CORNERS OF FOUNDATION WALLS (2 TOP AND 2 BOTTOM).
5- PROVIDE DOWELS BETWEEN ALL FOOTINGS, WALLS, AND PIERS TO MATCH SIZE AND SPACING OF VERTICAL REINFORCING.
6- ALL BLOCK SHALL BE TYPE N-1, MORTAR SHALL BE TYPE S, HORIZONTAL WIRE REINFORCING SHALL BE AT 16" O.C. VERTICAL IN ALL MASONRY WALLS.
7- FOR MASONRY OPENINGS FURNISH ONE 3 1/2" X 3 1/2" X 5/16" ANGLE FOR EACH 4" OF WALL THICKNESS FOR SPANS UP TO 5'-0", UNLESS OTHERWISE NOTED.
8- PROVIDE TEMPORARY BRACING AS REQUIRED TO INSURE THE STABILITY OF THE STRUCTURE UNTIL THE PERMANENT STRUCTURE IS IN PLACE.
9- VERIFY EXACT SIZE AND LOCATION OF ALL FLOOR AND ROOF OPENINGS WITH MECHANICAL AND PLUMBING CONTRACTORS.

PROJECT:

Renovation
Car Wash

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Detroit , Michigan

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ADNAN AL-SAATI

SUBMITTALS

REVISIONS:

PROJECT NO
25-102
DATE
02/05/2025
SCALE
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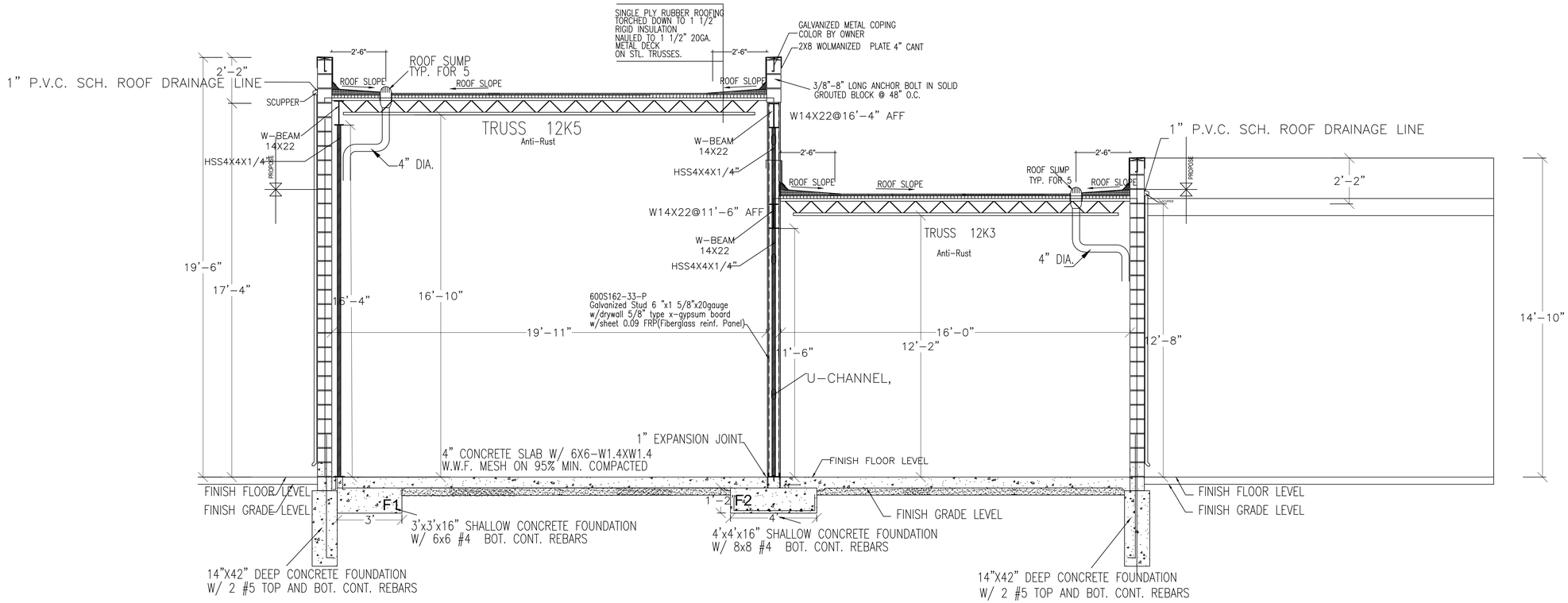
SHEET TITLE

PROPOSED STRUCTURE PLAN
PROPOSED FOUNDATION PLAN

A-08

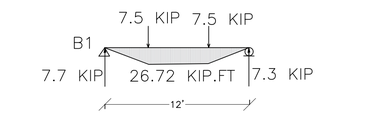
SEAL

STATE OF MICHIGAN
ADNAN H AL-SAATI
ENGINEER
No.
6201038325
PROFESSIONAL ENGINEER

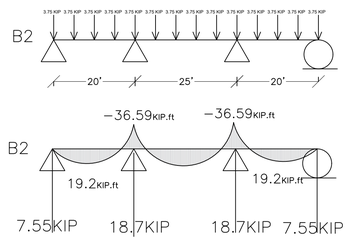


CROSS SECTION A-A AT STEEL TRUSS

SCALE 1/2" = 1'-0"



1-STEEL BEAM 1-SPAN 12' USE W12x14



2-STEEL BEAM 2-SPAN 25' USE W14x22

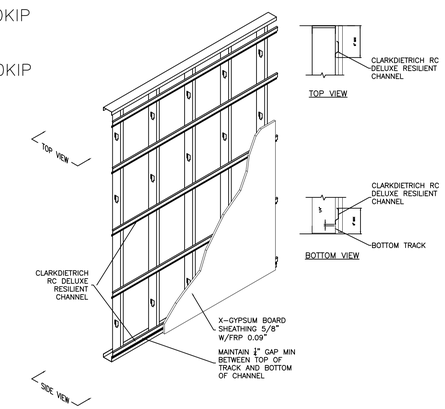
3-STEEL Column -Height 16'-11" USE HSS4x4x1/4" -20KIP/40KIP

4-SPREAD FOOTING F1 -DEPTH16" USE 36"X36" W/6x6#4- 20KIP

5-SPREAD FOOTING F2 -DEPTH16" USE 48"X48" W/8x8#4- 40KIP

6- Design Bearing Wall:
Lateral load: 7.5 psf
Deflection: L/360
Limiting height: 17ft
Assembly
Stud web width: 6"
Stud Flange: S162 (1-5/8")
Stud spacing: 16"
Punched
600S162-33-P
S162 (1-5/8" Flange Structural Stud) Punched
33mils (20ga) 33ksi

Interior Walls w/ Structural Framing at 7.5 psf
Limiting Height
Spacing L/360
16 19'-10"



RESILIENT CHANNEL APPLICATION DETAIL
RC DELUXE

1- DEAD LOADS:

SINGLE PLY RUBBER ROOFING	2 PSF
RIGID INSULATION 1.5"	1 PSF
20 GA METAL DECK 1.5"	2 PSF
OWN WEIGHT TRUSS	6 PSF
2- LIVE LOAD :	20 PSF
3- SNOW LOAD :	30 PSF
4- WIND UPLIFT:	15 PSF
5- MECHANICAL EQ. AVR.:	900 LB

TOTAL LOAD COMBINATION :
= D+L+S+0.75W=11+20+30+0.75x15= 72.24~=75PSF

FOR TRUSS JOIST SPACING 5 FEET
W=75X5=375 PLF

FROM TABLE ASD SERIES K --- FOR SPAN 20 FEET WE GET : 12K5

FOR SPAN 16 FEET W/MECHANICAL EQUIPMENT
TL=475 PLF --- WE GET : 12K3

FROM TABLE ASD SERIES K --- FOR SPAN 28 FEET WE GET : 16K9

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Car Wash

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ADNAN AL-SAATI

SUBMITTALS

REVISIONS:

PROJECT NO
25-102

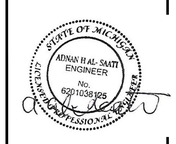
DATE
02/05/2025

SCALE
NOTED

SHEET TITLE
CROSS SECTION A-A

A-09

SEAL



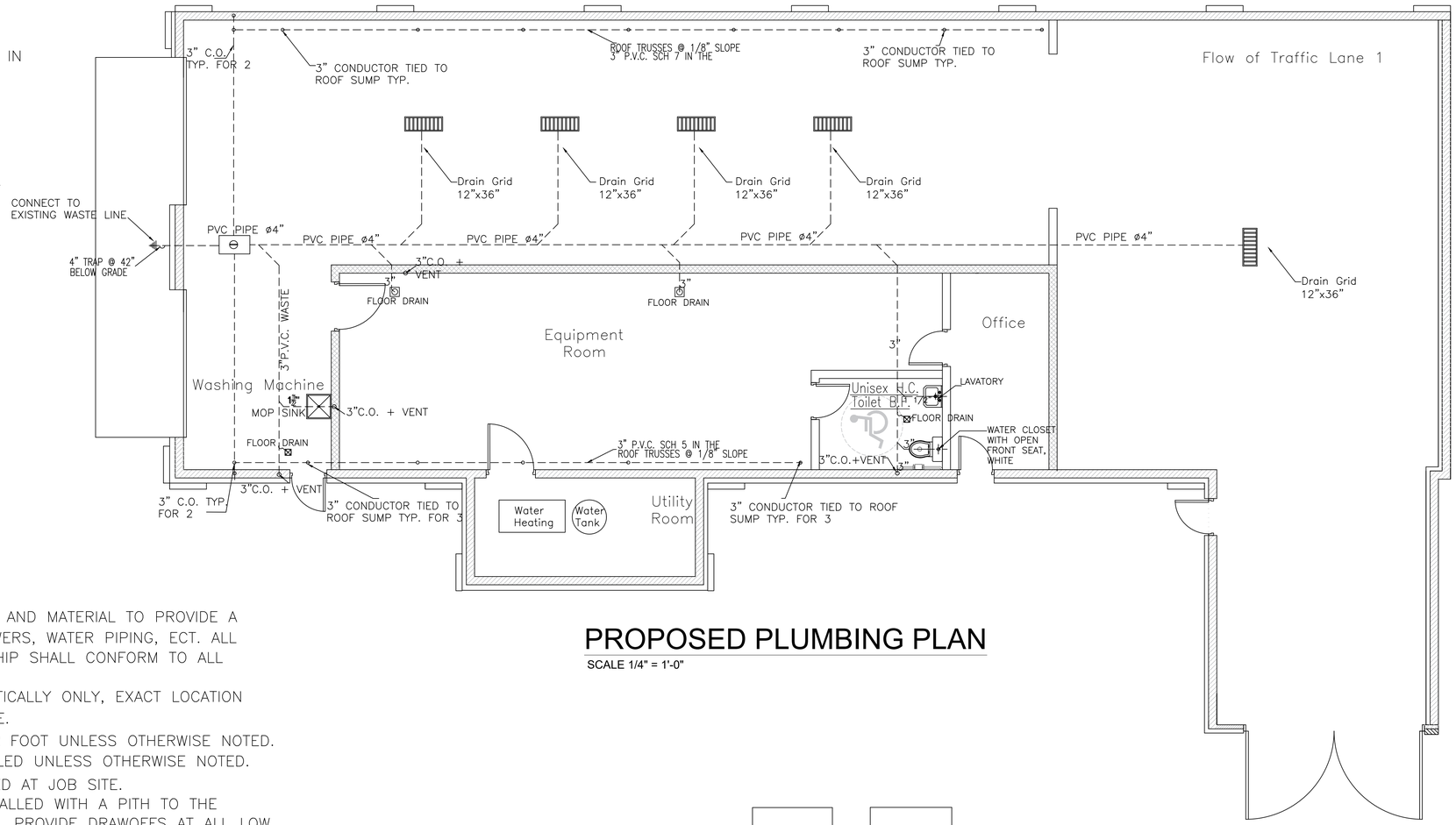
NOTE:

- ALL PLUMBING WORK SHALL BE CONDUCTED BY A LICENSED PLUMBER IN ACCORDANCE WITH LATEST PLUMBING CODE (2021).
- NEW $1\frac{1}{2}$" UNDERGROUND SEWER LINE SHALL HAVE $\frac{1}{4}$" PER 1' SLOPE

—Typical car wash tunnel uses a substantial amount of water. use, car wash moderate drain use 100 gallons per minute (GPM)

—Required Drain Length=25GPM/ft/ 100GPM=4linear feet of drain

—Typical Grill Drain Section Size: Often, each grill drain section is around 1 to 3 feet in length. Let's assume 1.5 feet per section for calculation.
Number of Grill Drains=4linear feet/ 1 feet per section= 4grill drains



PROPOSED PLUMBING PLAN

SCALE 1/4" = 1'-0"

PLUMBING NOTES:———

1— FURNISH ALL LABOR , EQUIPMENT AND MATERIAL TO PROVIDE A COMPLETE SYSTEM OF PLUMBING, SEWERS, WATER PIPING, ECT. ALL PLUMBING MATERIALS AND WORKMANSHIP SHALL CONFORM TO ALL STATE AND LOCAL CODES.

2— ALL PIPING IS SHOWN DIAGRAMMATICALLY ONLY, EXACT LOCATION WILL BE DETERMINED AT THE JOB SITE.

3— PITCH ALL DRAIN LINES 1/8" PER FOOT UNLESS OTHERWISE NOTED.

4— ALL PLUMBING SHALL BE CONCEALED UNLESS OTHERWISE NOTED.

5— ALL ELEVATIONS SHALL BE VERIFIED AT JOB SITE.

6— ALL WATER PIPING SHALL BE INSTALLED WITH A PITH TO THE DRAINS, PLUMBING CONTRACTOR SHALL PROVIDE DRAWOFFS AT ALL LOW POINTS. WATER PIPING SHALL BE GALVANIZED IRON OR TYPE "L" ABOVE GRADE AND TYPE "K" BELOW GRADE COPPER WITH SILFLOS JOINTS.

7— PROVIDE ALL REQUIRED SHUT— OFF VALVES, UNIONS AND FITTINGS, PROVIDE BALL VALVES AT ALL FOOD SERVICE EQUIPMENT.

8— HOT AND/ OR COLD WATER DROPS TO 2 OF MORE FIXTURES SHALL RUN FULL SIZE TO AIR CHAMBERS BEYOND THE FURTHEST FIXTURE BRANCH FROM DROPS. PROVIDE 12" AIR CHAMBERS AT ALL FIXTURES.

9— ALL HOT AND COLD WATER PIPING TO BE INSULATED. WRAP DOMESTIC COLD WATER WITH ANTI—SWEAT TAPE.

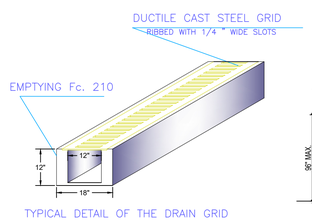
10— ALL PLUMBING AND SEWER TRENCHING, BACKFILLING AND SPECIAL CUTTING SHALL BE BY THIS CONTRACTOR. INTERIOR TRENCHES SHALL BE BACKFILLED WITH SAND. EXTERIOR TRENCHES, WHEN COMPLETED, SHALL HAVE THE SAME LOAD BEARING CAPACITY AS ADJACENT GRADES.

11— ALL WASTE AND SOIL PIPING SHALL BE GALVANIZES OR CAST IRON WHERE SUSPENDED. CAST IRON WHERE UNDERGROUND (P.V.C. ACCEPTABLE WHERE CODE PERMITS). VITRIFIED CLAY PIPE 5'—0" FROM BUILDING.

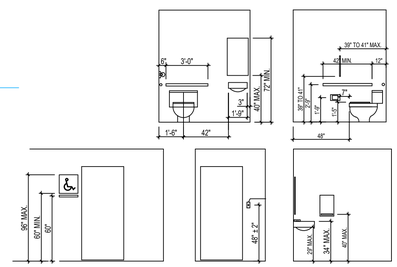
12— ALL P.V.C. PIPING SHALL BE SCHEDULE 40, EXCEPT WHERE NOTED.

13— ALL PIPING ABOVE THE CEILING TO BE OF NONCOMBUSTIBLE MATERIAL.

14— THIS CONTRACTOR SHALL GUARANTEE THAT ALL THE EQUIPMENT, MATERIALS AND WORKMANSHIP SHALL BE FREE FROM DEFECTS FOR A PERIOD OF ONE YEAR AFTER FINAL ACCEPTANCE.



TYPICAL DETAIL OF THE DRAIN GRID



PLUMBING FIXTURES NOTES

MOP SINK
FIAT MODEL #TSB—3010 24"X24"X12"
PROVIDE CHICAGO MODEL #835 SINK FAUCET
HAND SINK
WALL MOUNTED S.S. SINK
WATER HEATER
SMITH 75 GAL WATER HEATER
WATER CLOSET
AMERICAN STANDARD 2168.128 ELONGATED SIPHON ACTION W/ OL SONITE #95 SEAT—OPEN FRONT, WHITE
LAVATORY
BRIGGS MOD #6640 20"W 17"D
FAUCET BRIGGS BRASSWARE MOD #115WB
PROVIDE TEP. VALVE FOR H.C. LAV HOT WATER

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Renovation
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APPROVED BY:
ADNAN AL-SAATI

SUBMITTALS

REVISIONS:

PROJECT NO
25-102
DATE
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SCALE
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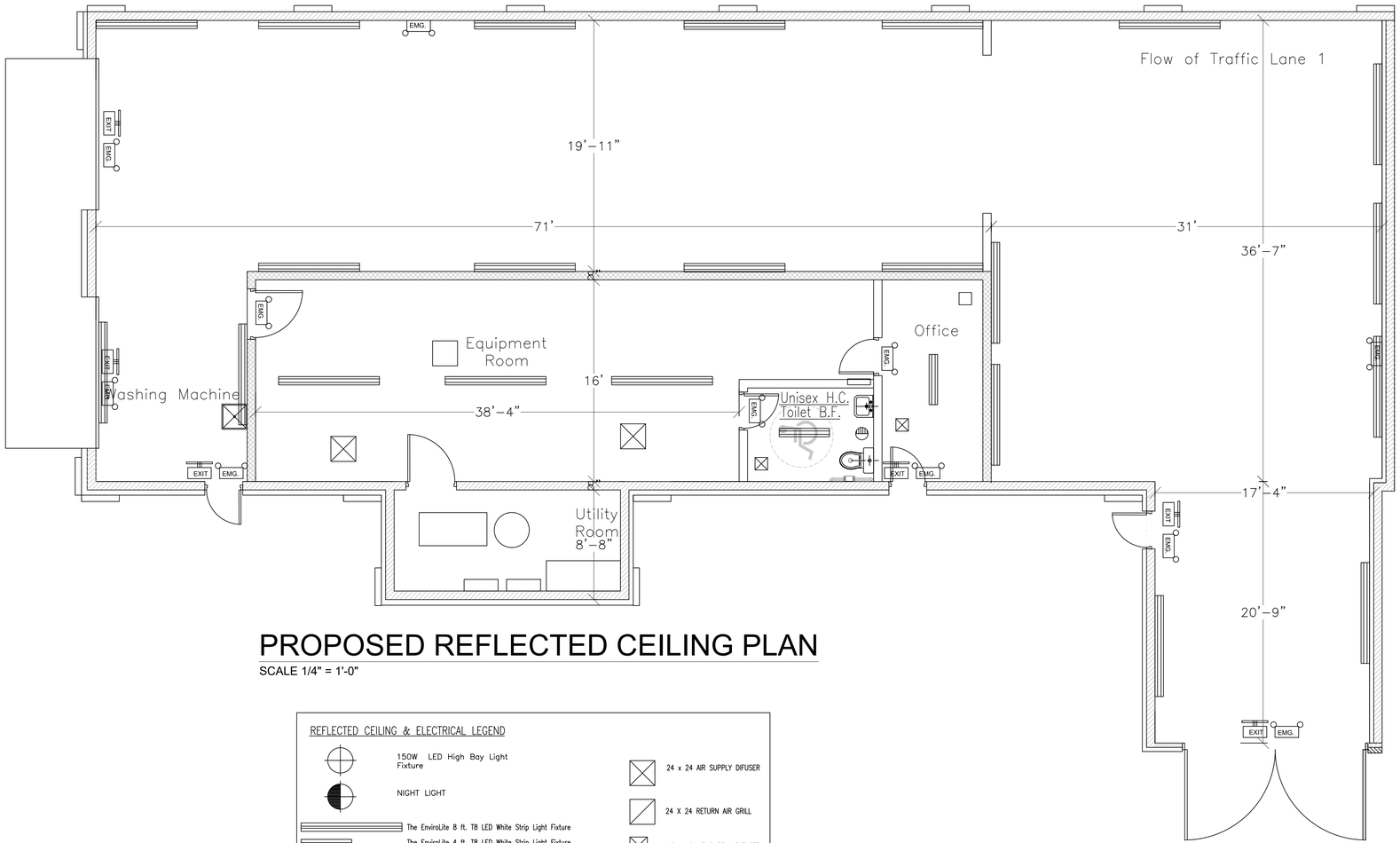
SHEET TITLE
Proposed Plumbing Plan

A-10

SEAL

STATE OF MICHIGAN
ADNAN H AL-SAATI
ENGINEER
No. 6201038925
PROFESSIONAL ENGINEER



PROPOSED REFLECTED CEILING PLAN

SCALE 1/4" = 1'-0"

REFLECTED CEILING & ELECTRICAL LEGEND

- 150W LED High Bay Light Fixture
- NIGHT LIGHT
- The EnviroLite 8 ft. T8 LED White Strip Light Fixture
- The EnviroLite 4 ft. T8 LED White Strip Light Fixture
- 18"x48" WRAP AROUND FLOURESCENT LIGHT FIXTURE T-8, 4-32W ACRYLIC LENS 142W.
- NIGHT LIGHT FIXTURE
- EXIT STANDARD ,WALL MOUNTED EXIT LIGHT FIXTURE W/ BACK-UP BATTERY
- EMG. STANDARD,WALL MOUNTED EMERGENCY LIGHT FIXTURE W/ BACK-UP BATTERY
- 24 x 24 AIR SUPPLY DIFUSER
- 24 X 24 RETURN AIR GRILL
- 12 x 12 AIR SUPPLY DIFUSER
- 12 X 12 RETURN AIR GRILL
- 12X6 RETURN AIR GRILL
- 12X6 AIR SUPPLY GRILL
- 100 CFM EXAUST FAN

NOTES:

-ALL ELECTRICAL WORK SHALL BE CONDUCTED BY A LICENSED ELECTRICIAN IN ACCORDANCE WITH LATEST ELECTRICAL CODE (2023 National Electrical Code (NEC).

-This is Primary Calculation
For a car wash tunnel, we previously estimated that 75 lumens/ft² is a reasonable target.
Required Lumens=
3231ft2×75lumens/ft2=242,325lumens

-Lumens per fixture: 13,600 lumens
Number of fixtures required:
242,325÷13,600≈18 fixtures
Final Recommendation:
Use 18 fixtures of T8, 2-lamp, 8-ft type.
Two-row staggered layout (9 fixtures per row).
Spacing: Approximately 8.5-9 feet apart in each row.

-Target illumination: 75 lumens/ft²
Total area: 14 ft × 38 ft = 532 ft²
Required lumens:
532×75=39,900 lumens
2. Determine Number of Fixtures
Each fixture provides: 13,600 lumens
Required fixtures:
39,900÷13,600≈3 fixtures

-Choose The EnviroLite 8 ft. T8 LED White Strip Light Fixture is designed for commercial and industrial applications, offering energy efficiency and durability.

Key Specifications:
Dimensions: 96 inches (length) x 4.43 inches (width) x 2.1 inches (height)
Weight: Approximately 12.5 lbs
Voltage: 120V to 277V multi-volt
Wattage: 56 watts
Lumen Output: 7,200 lumens
Color Temperature: Available in 4,000K and 5,000K options

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SUBMITTALS

REVISIONS:

PROJECT NO
25-102
DATE
02/05/2025
SCALE
NOTED

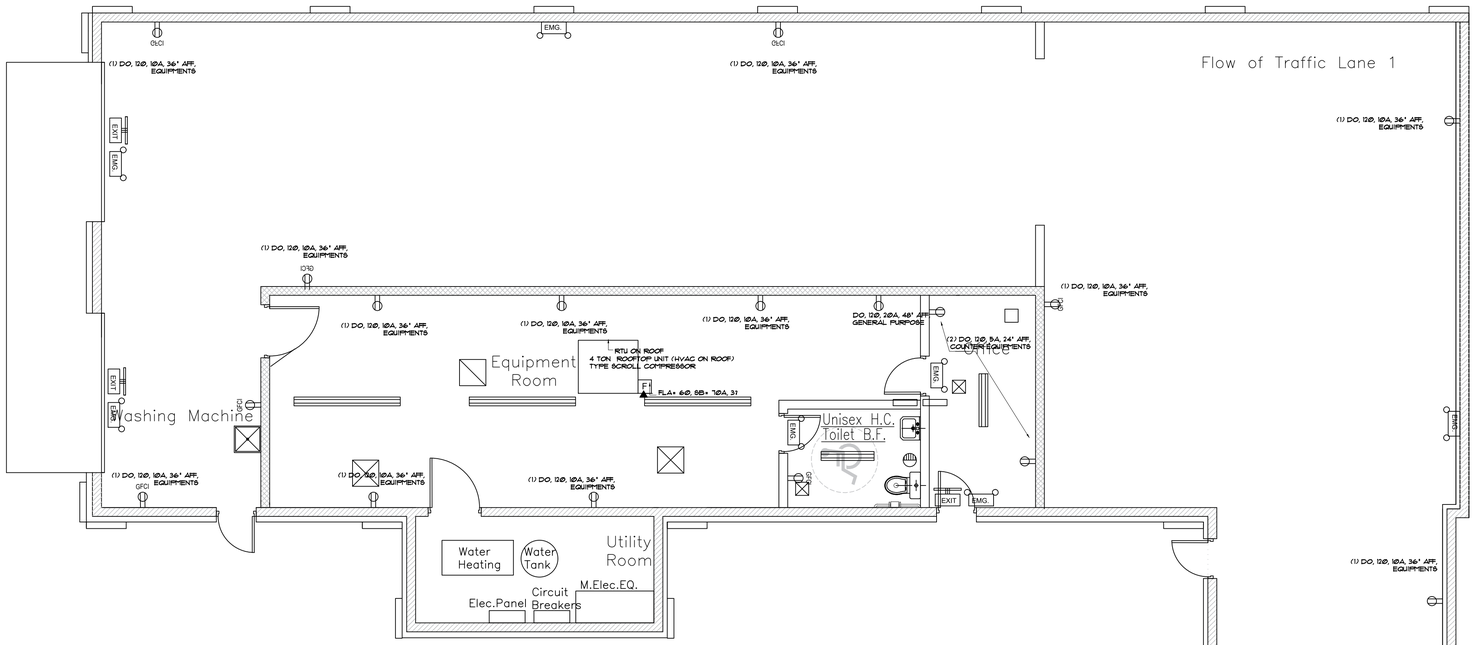
SHEET TITLE

Proposed Reflected Ceiling Plan

A-11

SEAL

STATE OF MICHIGAN
ADNAN H AL-SAATI
ENGINEER
No. 6201038125
PROFESSIONAL ENGINEER



PROPOSED POWER PLAN / RISER DIAGRAM

SCALE 1/4" = 1'-0"

Electrical Load Calculation for Car Wash Project:

Three–Phase Loads (230V, 3–Phase)
Blowers (3 x 10 HP): 62.42 A
HVAC Compressor (4 Ton, 14.5 SEER): 39.24 A
Total Three–Phase Current: 101.66 A
Recommended Three–Phase Panel Size (with 125% NEC Rule): 127 A

Single–Phase Loads (230V, 1–Phase)

LED High Bay Fixtures (15 units, 150W each): 9.78 A
Wrap Fluorescent T–8 (3 units, 32W each): 0.42 A
Wall Mounted Fixtures (14 units, 60W each): 3.65 A
Receptacles (16 units, 180W each): 12.52 A
Total Single–Phase Current: 26.37 A
Recommended Single–Phase Panel Size (with 125% NEC Rule): 33 A

Main Panel Sizing:

A 150A, 3–phase panel should be used to accommodate future expansion and voltage drops.
A 40A single–phase sub–panel may be used for lighting and receptacles.
Circuit Breaker Recommendations:

Conveyor Motor:

A 65–foot conveyor in a commercial car wash typically requires between 10 to 30 HP.
Converted to kW: 10HP×0.746=7.46kW
30 HP×0.746=22.38 kW

Washing Equipment:

Pumps and Heaters: Approximately 10 kW.
Control Systems and Lighting:

Control Systems: Around 2–5 kW.
Lighting: Approximately 5–10 kW depending on the setup.

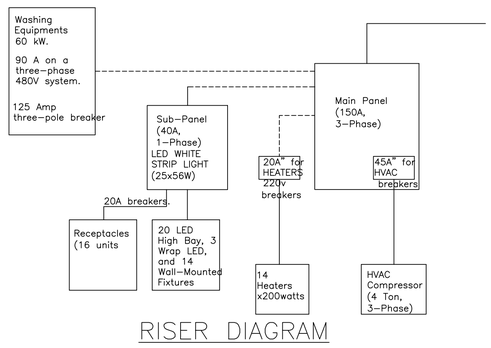
Total Power=22.38 kW+10 kW+5 kW+10 kW=47.38 kW

Adjusted Power=47.38 kW×1.25=59.225 kW

I=59.225/(1.732×480×0.8)≈0.089kAI
I≈89 A

Notes:
Ensure the wire's ampacity (current carrying capacity) is appropriate for the continuous load.
Use 75°C copper wire unless specified differently.
Check the length of the wire run: for longer distances, you might need to use larger wire to account for voltage drop.

Component	Current	Recommended Wire Size
Heaters	20A	#12 AWG
HVAC Compressor (4 Ton York – 3–Phase)	39.24A	#8 AWG
LED High Bay Fixtures (15 x 150W)	9.78A	#14 AWG
Wrap LED T–8 Fixtures (3 x 32W)	0.42A	#18 AWG
Standard Wall–Mounted Fixtures (14 x 60W)	3.65A	#14 AWG
Receptacles (16 x 180W)	12.52A	#12 AWG
Washing Equipments	90 A	# 4 AWG



RISER DIAGRAM

ELECTRICAL NOTES

– IT IS THE RESPONSIBILTY OF THE OWNER TO SUBMIT THESE PLANS FOR APPROVAL PRIOR TO START OF WORK.
– ALL MATERIAL AND WORKMANSHIP SHALL CONFORM TO THE REQUIREMENTS OF APPLICABLE BUILDING CODES AND ORDINANCES.
– CONTRACTORS SHALL OBTAIN AND PAY FOR ALL THE PERMIT FEES THAT ARE RELATED TO THEIR PART OF WORK.
– IT IS IMPORTANT FOR CONTRACTORS TO VISIT THE JOB SITE TO BECOME FAMILIAR WITH THE SCOPE OF WORK.
– PRIOR TO START OF WORK, CONTRACTORS TO CHECK AND VERIFY ALL DIMENSIONS ON THE FIELD, REPORT ANY ERRORS, OMISSIONS, OR POSSIBLE DISCREPANCIES TO THE OWNER/ OR ARCHITECT.
– ELECTRICAL CONTRACTOR SHALL VERIFY EXISTING SERVICE, CT BOX, PHASE, METER LOCATION AND SHALL PERFORM THE WORK TO MEET JOB REQUIREMENT AS PER CODE.
– THESE PLANS SHOW ROUGH–IN REQUIREMENTS FOR THE EQUIPMENTS DISCUSSED WITH OWNER AT THE START AND DURING THE DESIGN PROCESS. CONTRACTORS TO CHECK WITH OWNER FOR ANY CHANGES, SO THE SERVICE REQUIREMENTS ARE SIZED AND ROUGHED–IN PROPERLY.
– CONTRACTORS ARE RESPONSIBLE TO CHECK THE SPECIFICATION SHEETS OF ALL EQUIPMENTS TO BE USED ON THIS JOB, TO PROPERLY LOCATE THE ROUGH–IN LOCATION AND TO SUPPLY ALL FITTINGS NEEDED TO DO THE FINAL CONNECTIONS OF ALL EQUIPMENTS.
– ALL SERVICES SHOWN WITH SYMBOLS CENTERED ON FACE OF WALL, SERVICE BROUGHT TO THAT POINT CONCEALED IN WALL STUBBED OUT OF FLOOR CENTERED AT HEIGHT SHOWN. DO NOT STUB OUT OF FLOOR AND RUN EXPOSED ON FACE OF WALL.
– ALL SERVICES SHOWN WITH SYMBOLS AWAY FROM ANY WALL OR COLUMN SHOULD BE STUBBED OUT OF FLOOR TO A MAXIMUM OVERALL HEIGHT AS SHOWN.

ELECTRICAL ABBREVIATIONS & SYMBOLS

E.C.	▼	ELECTRICAL CONNECTION – CONDUIT
D.R.	⏚	DUPLEX RECEPTACLE
S.R.	⏚	SINGLE RECEPTACLE
HP		HORSE POWER
K.W.		KILOWATT
W.		WATT
AMP		AMPERAGE
V.		VOLTAGE
SW		SWITCH
JB.		JUNCTION BOX
		INCANDESCENT LIGHT
		WHITE LED LIGHT
A.F.F.		ABOVE FINISHED FLOOR
D.F.A.		DROP FROM ABOVE
BT		BRANCH & CONNECT TO

ELECTRICAL SYMBOLS LEGEND

	HOME RUN TO PANEL
	CONDUIT RUN UNDERGROUND
	LIGHTING OR POWER PANEL
	DUPLEX RECEPTACLE, GROUNDING TYPE, 20A, 120V
C	DUPLEX RECEPTACLE, GROUNDING TYPE, FLUSH CEILING MOUNTED, 20A, 120V
Q	QUAD RECEPTACLE, GROUNDING TYPE, 20A, 120V
GFCI	DUPLEX RECEPTACLE, GROUND FAULT INTERUPT CAPACITY, MOUNTED 48" AFF 20A, 120V
J	JUNCTION BOX OR PULL BOX – SIZED PER NEC
$	SINGLE POLE TOGGLE(LIGHT) SWITCH 20A, 120V
$2	DOUBLE POLE TOGGLE(LIGHT) SWITCH 20A, 120V
$3	THREE WAY TOGGLE(LIGHT) SWITCH 20A, 120V
▼	ELECTRICAL CONNECTION – CONDUIT
M	THREE PHASE MOTOR
F	FUSED DISCONNECT SWITCH
	NON–FUSED DISCONNECT SWITCH
	TIME SWITCH/CONTACTOR

PROJECT:

Renovation
Car Wash

LOCATION:

14615 Jefferson Avenue
Detroit , Michigan

A & M CONSULTANTS

835 MASON,STE. B290
DEARBORN, MI-48124
PH:(313) 582-0022
FAX:(313) 582-0028

DRAWN BY:
Ahmad Habli

APPROVED BY:
ADNAN AL-SAATI

SUBMITTALS

REVISIONS:

PROJECT NO
25-102

DATE
02/05/2025

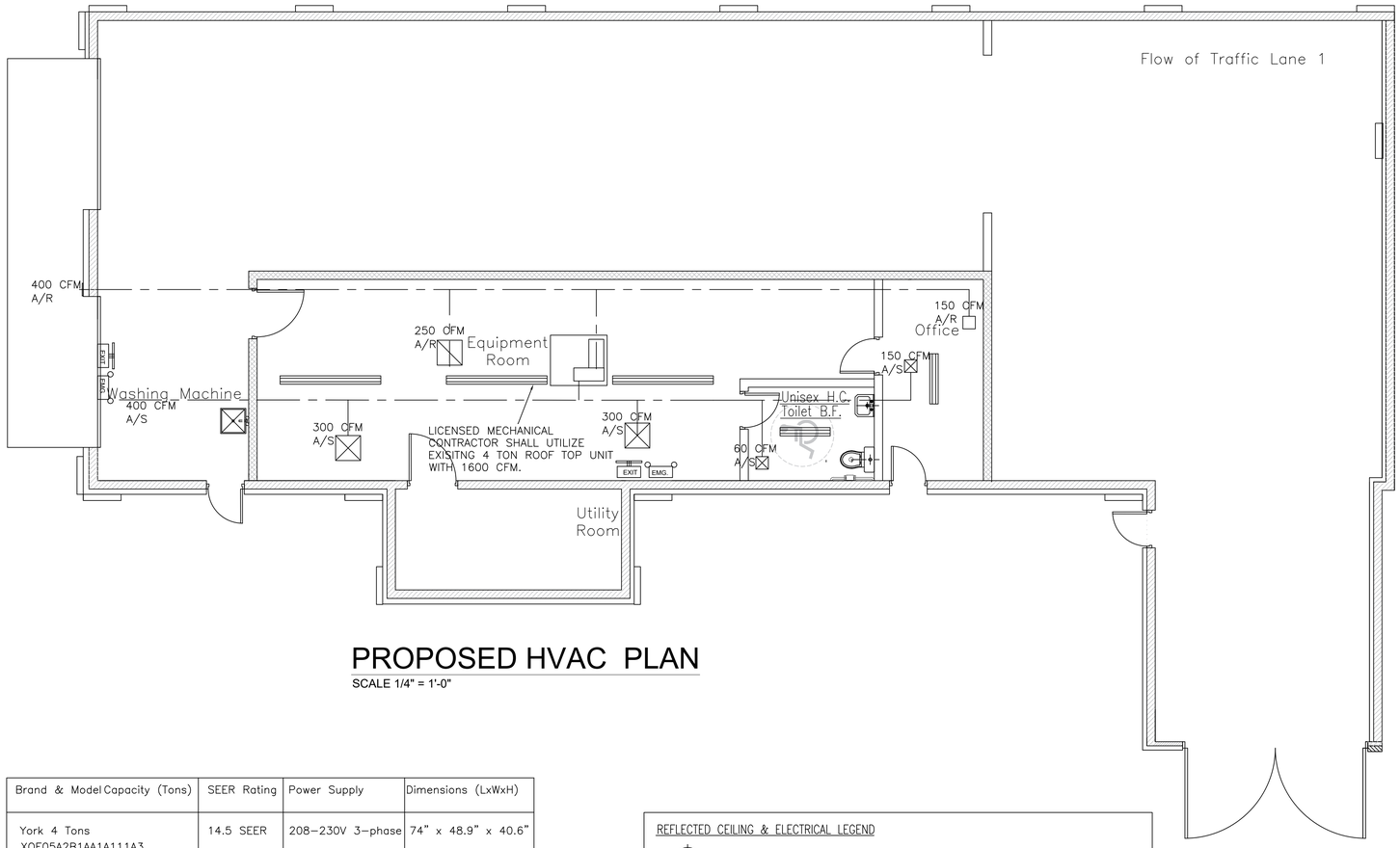
SCALE
NOTED

SHEET TITLE
Proposed Power Plan
Proposed RISER DIAGRAM

A-12

SEAL

STATE OF MICHIGAN
ADNAN H AL-SAATI
ENGINEER
No. 6201038125
PROFESSIONAL ENGINEER



PROPOSED HVAC PLAN

SCALE 1/4" = 1'-0"

Brand & Model	Capacity (Tons)	SEER Rating	Power Supply	Dimensions (LxWxH)
York 4 Tons XQE05A2B1AA1A111A3		14.5 SEER	208–230V 3–phase	74" x 48.9" x 40.6"

–Office space: ~1 ton per 250–300 ft²
Mechanical rooms: Higher load due to heat–generating equipment (~1 ton per 150–200 ft²)

–mixed–use, take an average: 4 tons

–The typical airflow per ton is 400 CFM per ton.
CFM=Tonnage×400

–Mixed–use (4 tons) → 1,600 CFM

REFLECTED CEILING & ELECTRICAL LEGEND

- 150W LED High Bay Light Fixture
- NIGHT LIGHT
- 96"– LED LIGHT FIXTURE T–8, 2–54W ACRYLIC LENS 108W.
- 18"x48" WRAP AROUND FLOURESCENT LIGHT FIXTURE T–8, 4–32W ACRYLIC LENS 142W.
- NIGHT LIGHT FIXTURE
- STANDARD ,WALL MOUNTED EXIT LIGHT FIXTURE W/ BACK–UP BATTERY
- STANDARD,WALL MOUNTED EMERGENCY LIGHT FIXTURE W/ BACK–UP BATTERY
- 24 x 24 AIR SUPPLY DIFUSER
- 24 X 24 RETURN AIR GRILL
- 12 x 12 AIR SUPPLY DIFUSER
- 12 X 12 RETURN AIR GRILL
- 12X6 RETURN AIR GRILL
- 12X6 AIR SUPPLY GRILL
- 100 CFM EXAUST FAN

MECHANICAL NOTES

1. MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE TO INSTALL HEATING SYSTEM COMPONENTS IN ACCORDANCE WITH STATE AND LOCAL CODES AS WELL AS THE NATIONAL FIRE PROTECTION ASSOCIATIONS REGULATIONS. MANUFACTURES INSTRUCTIONS AND RECOMMENDATIONS SHALL ALSO BE FOLLOWED.
2. ALL DUCTS SHALL BE SHEET METAL CONSTRUCTED IN ACCORDANCE WITH "S.M.A.C.N.A." LOW VELOCITY, LOW PRESSURE DUCT MANUAL – LATEST EDITION.
3. DUCTWORK INSTALLATION TO BE COORDINATED WITH ELECTRICAL WORK TO AVOID INTERFERENCE.
4. PROVIDE CANVAS–TYPE VINYL, VIBRATION–ELIMINATION CONNECTION TO EQUIPMENT.
5. THE HVAC SYSTEM SHALL BE COMPLETE WITH ALL NECESSARY APPURTENANCES FOR SATISFACTORY OPERATION. CONTRACTOR SHALL WARRANTEE ALL MATERIALS AND GUARANTEE ALL WORKMANSHIP FOR ONE YEAR FROM SUBSTANTIAL COMPLETION.
6. MECHANICAL CONTRACTOR TO INSTALL ALL LOW VOLTAGE WIRING IN ACCORDANCE WITH ALL STATE AND LOCAL CODES.
7. MECHANICAL CONTRACTOR SHALL PROVIDE AND INSTALL A SMOKE DETECTOR IN THE RETURN AIR OF ROOFTOP HVAC UNIT.
8. ALL BRANCH DUCTS SHALL HAVE BALANCING DAMPER.
9. ALL SUPPLY AIR DIFFUSERS ARE BASED ON "CARNES" MODEL NO. RAPAH, SIZES SHOWN ON DRAWINGS. ALL GRILLES SHALL HAVE INSULATED SOUND BOOT, MINIMUM 36" LONG, OPEN TO PLENUM SPACE.
9. NO FLEX DUCT.
10. ALL SUPLY AIR DIFFUSERS ARE BASED ON "CARNES" MODEL NO. SFTB SIZES SHOWN ON DRAWINGS.
11. FLEXIBLE RUNOUTS TO DIFFUSERS TO BE A MAXIMUM OF 8'–0" IN LENGTH.
12. COORDINATE MECHANICAL EQUIPMENT AND MATERIALS INSTALLATION WITH OTHER BUILDING COMPONENTS. COORDINATE THE INSTALLATION OF MECHANICAL MATERIALS AND EQUIPMENT ABOVE CEILINGS WITH SUSPENSION SYSTEM, LIGHT FIXTURES, AND OTHER INSTALLATIONS.
13. FOR ALL AIR SYSTEMS ADJUST FANS, SUPPLY REGISTER DAMPERS, AND DUCT VOLUME DAMPERS AS NEEDED TO BALANCE ALL DUCTWORK TO MATCH CFM LISTED.
14. ALL DIFFUSERS AND GRILLES SHALL BE FACTORY FINISHED WHITE.
15. ALL MECHANICAL EQUIPMENT SHALL HAVE VIBRATION ISOLATORS, AS WELL AS FLEXIBLE DUCT CONNECTORS.
16. PROVIDE VOLUME DAMPERS AT EACH BRANCH OF A TRUNK DUCT TO A SUPPLY DIFFUSER.
17. MECHANICAL CONTRACTOR SHALL FURNISH RECORD SET OF DRAWINGS WITH ANY DEVIATIONS MARKED IN RED INK.

PROJECT:

Renovation
Car Wash

LOCATION:

14615 Jefferson Avenue
Detroit , Michigan

A & M CONSULTANTS

835 MASON,STE. B290
DEARBORN, MI-48124
PH:(313) 582-0022
FAX:(313) 582-0028

DRAWN BY:

Ahmad Habli

APPROVED BY:

ADNAN AL-SAATI

SUBMITTALS

REVISIONS:

PROJECT NO
25-102

DATE
02/05/2025

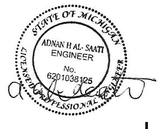
SCALE
NOTED

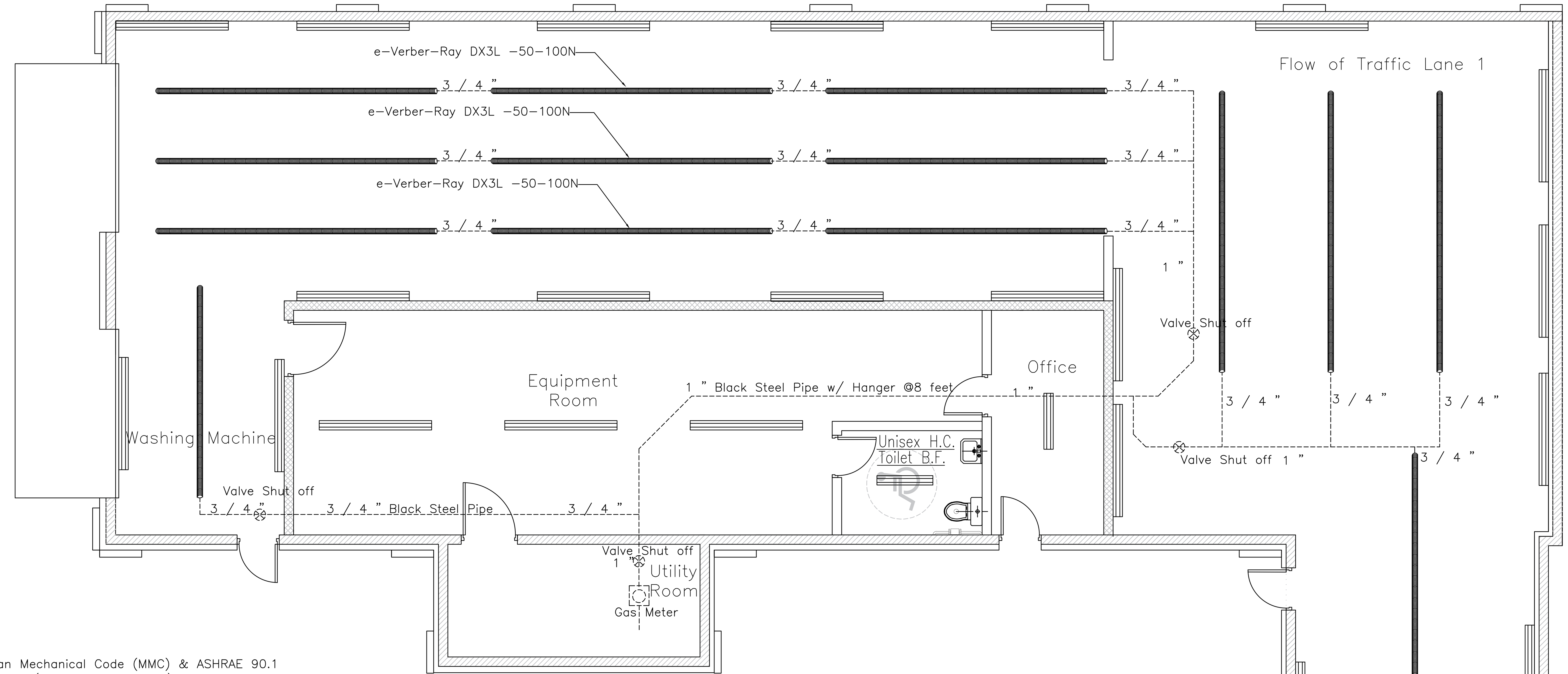
SHEET TITLE

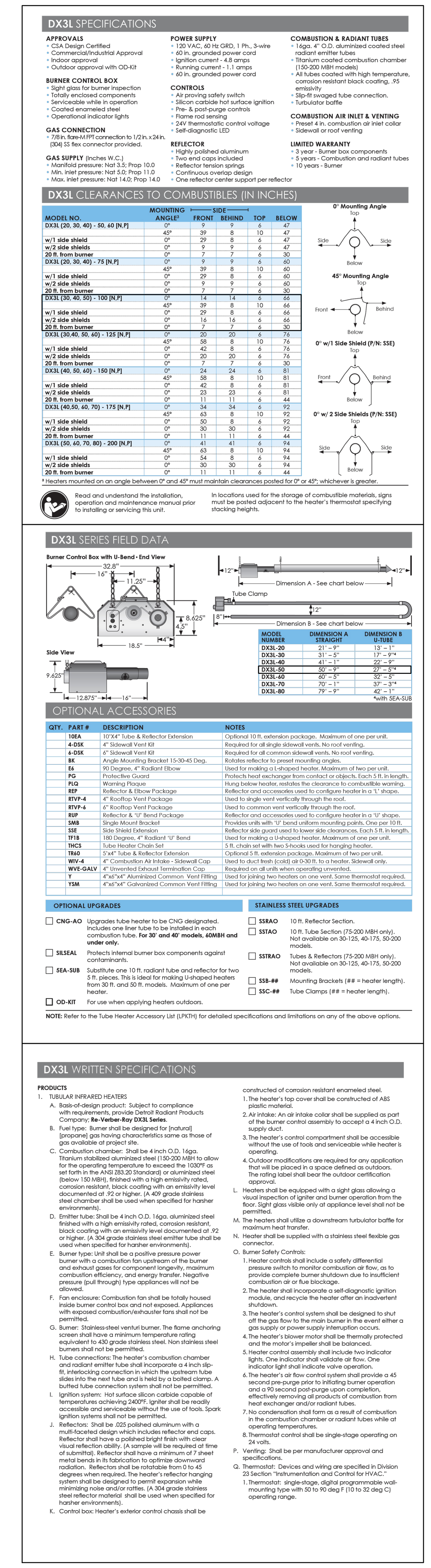
Proposed HVAC Plan

A-13

SEAL







PROPOSED HEATING PLAN

SCALE 1/4" = 1'-0"

Michigan Mechanical Code (MMC) & ASHRAE 90.1
MMC 2021 (Based on IMC 2021):

Section 603: Duct & ventilation requirements
Section 312: Radiant heating must meet ASHRAE standards
ASHRAE 90.1: Minimum energy efficiency requirements
NFPA 88A (Car Wash Fire Safety)

Gas-fired radiant heaters must be installed per NFPA 54
Clearance from combustibles is required

Heat Loss (Building Heat Load)

Indoor design temperature: 50–60°F (as recommended for car washes)
Outdoor design temperature: −10°F to 0°F (for Michigan)
ΔT (Temperature Difference): 60°F to 70°F
Building materials: U-values depend on insulation and wall construction

Q roof=U roof×A roof×ΔT
Heat Loss Through Doors & Openings
Tunnel car washes have large open bay doors, leading to significant infiltration heat loss. ASHRAE provides:

Q infiltration=1.1×CFM×ΔT
CFM (Cubic Feet per Minute) = Air change rate × Building volume
Recommended air change rate: 6–10 ACH (Air Changes per Hour)
Volume Calculation:

V=Area×Height=3,232×16=51,712 ft3

Assuming ACH = 8:

CFM= 8×51,712 /60=6,895 CFM

Q infiltration=1.1×6,895×60=454,030 BTU/hr

Total Heat Loss Estimate
Summing all components:
Q total=Q walls+Q roof+Q doors+Q infiltration

Heating power required
Gas-fired radiant heaters: 30–60 BTU/ft²
Hydronic radiant floors: 20–40 BTU/ft²
Q required =30×3,232=96,960 BTU/hr
Q required =40×3,232=129,280 BTU/hr
Select Infrared Tube Heater Type & Layout

To distribute heat evenly, multiple heaters should be installed along the tunnel. Common configurations:
3 Heaters at 50,000 BTU/hr Each

Spacing:
Position heaters along the centerline or staggered along the sides
Tilt heaters at a slight angle to maximize coverage
Keep at least 3 feet away from car wash equipment

Each Heater consumes approximately 200 watts for the ignition and control systems,
the Total electricity consumption would be:

14Heaters×200watts=2800watts(or 2.8 kW)

MECHANICAL NOTES

1. MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE TO INSTALL HEATING SYSTEM COMPONENTS IN ACCORDANCE WITH STATE AND LOCAL CODES AS WELL AS THE NATIONAL FIRE PROTECTION ASSOCIATIONS REGULATIONS. MANUFACTURES INSTRUCTIONS AND RECOMMENDATIONS SHALL ALSO BE FOLLOWED.

E-Verber-Ray DX3L Series (Detroit Radiant Products)

Model: DX3L-50-100N (50,000 BTU/hr version available)

Fuel Type: Natural Gas or Propane

Tube Length: 20–30 ft (Flexible based on space constraints)

Mounting Height: 12–14 feet (Ideal for your 16-ft high ceiling)

Construction: Aluminized steel tubes with .95 emissive coating

Efficiency: 80–90%

Ignition: Hot surface ignition with pre- and post-purge controls

Durability: Corrosion-resistant, suitable for high-moisture environments

PROJECT:

Renovation
Car Wash

LOCATION:

14615 Jefferson Avenue
Detroit , Michigan

A & M CONSULTANTS

835 MASON,STE. B290
DEARBORN, MI-48124

PH:(313) 582-0022
FAX:(313) 582-0028

DRAWN BY:
Ahmad Habli

APPROVED BY:
ADNAN AL-SAATI

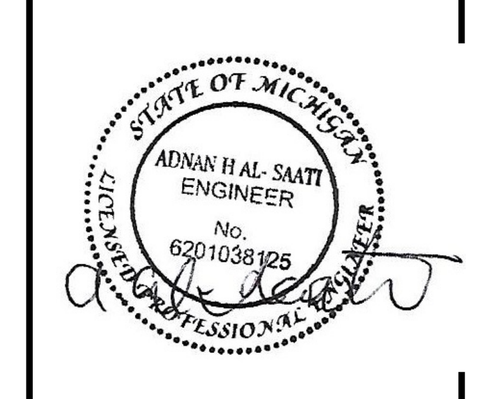
SUBMITTALS

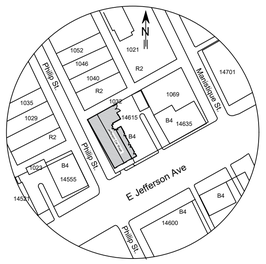
REVISIONS:

PROJECT NO
25-102
DATE
02/05/2025
SCALE
NOTED
SHEET TITLE
Proposed Heating Plan

A-14

SEAL





PROPOSED BUILDING RENOVATION FOR AN EXISTING CAR WASH

14615 E JEFFERSON AVENUE DETROIT,
MICHIGAN

PROJECT:
Renovation
Car Wash

LOCATION:
14615 E Jefferson Avenue
Detroit , Michigan

APPLICABLE CODES

BUILDING
MBC 2015 (MICHIGAN BUILDING CODE 2015)
EFFECTIVE APRIL 20, 2017
ACCESSIBILITY – ICCC ANSI A117.1–2009
PLUMBING
MPC 2021 (MICHIGAN PLUMBING CODE 2021)
MECHANICAL;
MMC 2021 (MICHIGAN MECHANICAL CODE 2021)
ELECTRICAL;
NEC 2023 (STATE OF MICHIGAN ELECTRICAL CODE)
2023 NATIONAL ELECTRICAL CODE WITH PART B AMENDMENTS
ENERGY
2015 (MICHIGAN ENERGY CODE)
FIRE
2015 (MICHIGAN FIRE CODE)

DESIGN PROFESSIONAL

A&M CONSULTANTS

835 MASON ST B290
DEARBORN, MI 48124
PH:(313)582-0022
FAX:(313)582-0028

SITE INFORMATION

PROPERTY DESCRIPTION(Parcel ID): 21000604
N--E JEFFERSON 1 W 11.84 FT 2 FOX CREEK SUB L25
P73 PLATS, W C R 21/295 45 X 125
PROPERTY DESCRIPTION(Parcel ID): 21000605
N--E JEFFERSON E 18.16 FT 2 3&4 FOX CREEK SUB L25
P73 PLATS, W C R 21/295 78.16 X 125

Building (1) Description:	Car Wash – One Story Commercial Building
Building(2) Description:	Detail Shop
Zoned :	B4
Size Property :	15395sq.ft = 0.353 acre(1acre=43560 ft^2)
Exist Gross Area :	5346 sq.ft
Proposed Gross Area:	4575 sq.ft
Flow of traffic line :	2898 sq.ft
Office:	128 sq.ft+= 4142 sq.ft
Mechanical :	144 sq.ft
Equipment :	698 sq.ft
Washing machine:	200 sq.ft
Bath:	74 sq.ft
Lot Coverage :	
Existing	33.77%
Proposed	29.75%

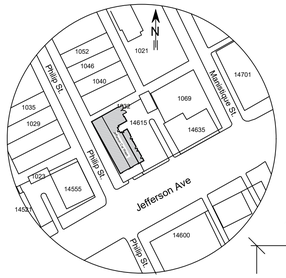
Building Height : Existing 12'/ Proposed 19'–6" feet &14'–9"
Occupancy/use classification: Use Group B Business
1person/100ft2= 2365.8/100=24 < 50 provide Min 2 Egress

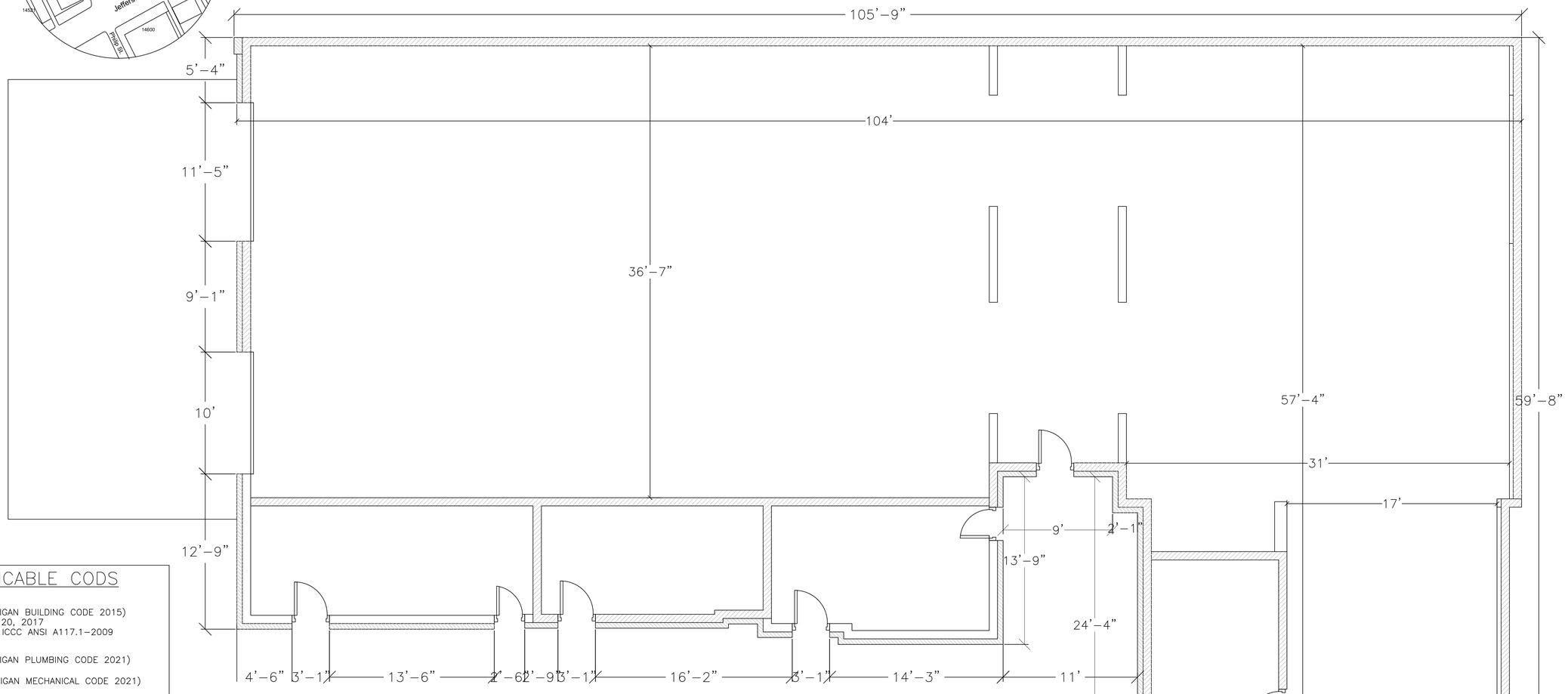
Construction type : Type III B – Construction (ext. wall non–combustible)
Sprinkler System : No
Parking : 1per/500ft^2 –Total parking spaces required=
4142x0.8 / 500= 7 Parking
Total parking spaces provided=7 include 1
Handicap (Min 1 H.C for 1–25 SPACES)
Building2Description : Detail Shop – Existing Area = 707 sq.ft

SHEET INDEX

STATE OF MICHIGAN
ADNAN H AL-SAATI
ENGINEER
No.
6201038925
LICENSED PROFESSIONAL ENGINEER

DATE: 02/05/2025			COVER SHEET
REV.: -/-/2025			





Existing Floor Plan

Scale : 1/4" = 1'-0"

APPLICABLE CODS

BUILDING
MBC 2015 (MICHIGAN BUILDING CODE 2015)
EFFECTIVE APRIL 20, 2017
ACCESSIBILITY – ICCC ANSI A117.1–2009

PLUMBING
MPC 2021 (MICHIGAN PLUMBING CODE 2021)
MECHANICAL:
MMC 2021 (MICHIGAN MECHANICAL CODE 2021)
FUEL GAS:
IFGC 2015 (INTERNATIONAL FUEL GAS CODE 2015)
ELECTRICAL:
NEC 2023 (STATE OF MICHIGAN ELECTRICAL CODE)
2023 NATIONAL ELECTRICAL CODE WITH PART B AMENDMENTS
REHAB:
MRCE 2015 (MICHIGAN REHABILITATION CODE FOR EXISTING BUILDING 2015)
FIRE CODE:
IFC 2015 (INTERNATIONAL FIRE CODE 2015), AS REFERANCED IN THE 2015 MICHIGAN BUILDING CODE

FIRE SUPPRESSION:
COMMERCIAL; NFPA 13 (2013)
FIRE ALARM:
COMMERCIAL; NFPA 72 (2013)

ENERGY CODE:
MBC 2015 (MICHIGAN BUILDING CODE 2015) – CHAPTER 13 &
MEC 2015 (MICHIGAN ENERGY CODE 2015) – CHPTERS 1 THROUGH 6 &
MICHIGAN ENERGY CODE, PART 10a, RULES (ANSI/ASHRAE/IES STANDARD 90.1–2013)

WALL LEGEND

- EXISTING MASONRY BLOCK WALL
- EXISTING MASONRY BRICK ON BLOCK WALL
- NEW METAL STUD WALL
- EXISTING PARTITION WALL STUDS 2X4”@16” W/5/8” Green Drywall

PROJECT:

Renovation
Car Wash

LOCATION:

14615 Jefferson Avenue
Detroit , Michigan

A & M CONSULTANTS

835 MASON,STE. B290
DEARBORN, MI-48124
PH:(313) 582-0022
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DRAWN BY:
Ahmad Habli

APPROVED BY:
ADNAN AL-SAATI

SUBMITTALS

REVISIONS:

PROJECT NO
25-102
DATE
02/05/2025
SCALE
NOTED

SHEET TITLE
EXISTING FLOOR PLAN

A-01

SEAL

STATE OF MICHIGAN
ADNAN H AL- SAATI
ENGINEER
No.
6201038105
PROFESSIONAL ENGINEER

PROPERTY DESCRIPTION(Parcel ID): 21000604
N--E JEFFERSON 1 W 11.84 FT 2 FOX CREEK SUB L25
P73 PLATS, W C R 21/295 45 X 125
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Mechanical :	144 sq.ft
Equipment :	698 sq.ft
Washing machine:	200 sq.ft
Bath:	74 sq.ft
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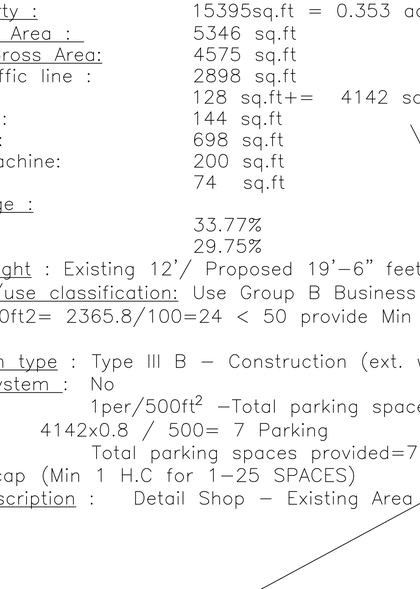
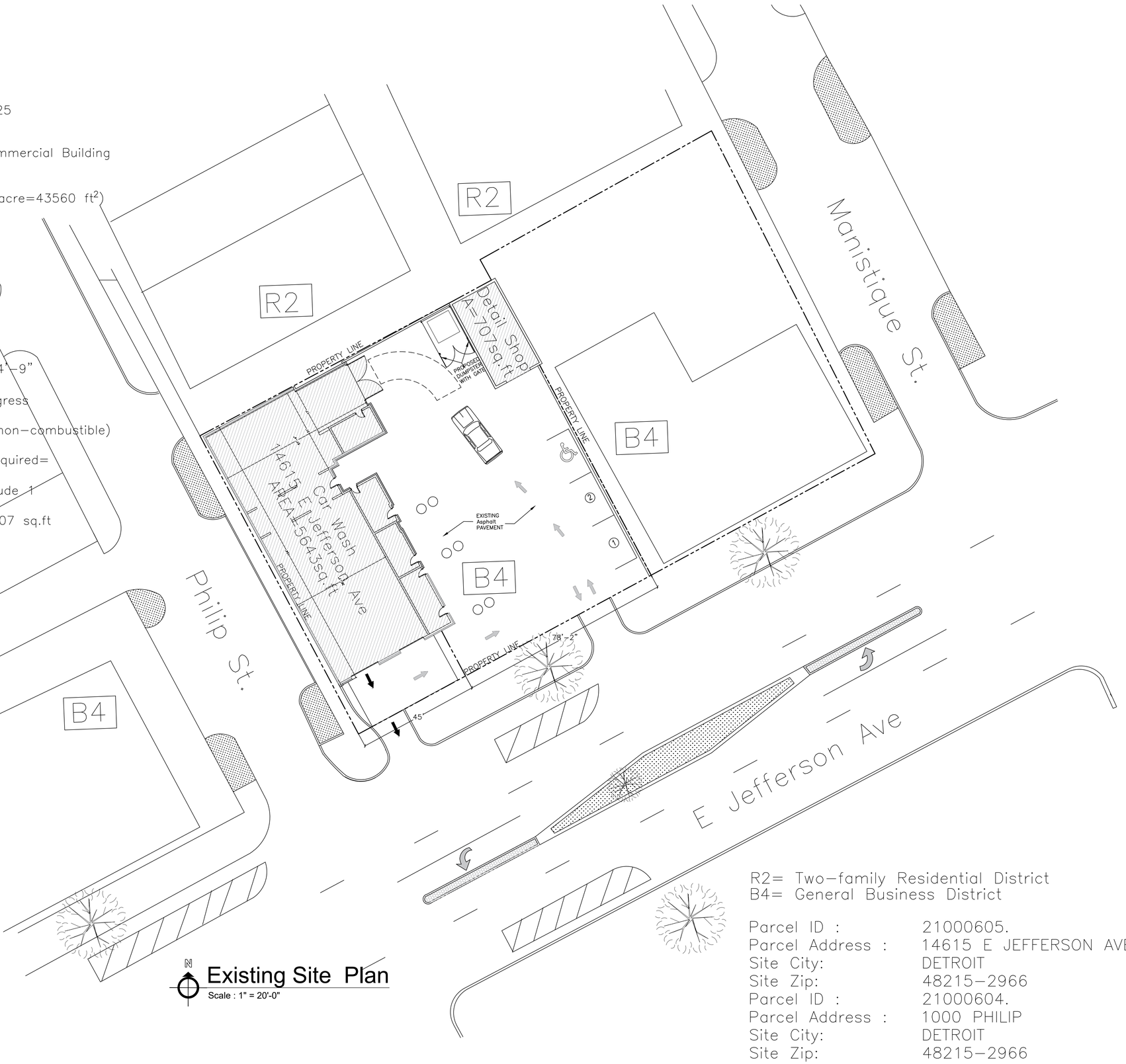
Building2Description : Detail Shop – Existing Area = 707 sq.ft



DUMPSTER DETAIL



N
Existing Site Plan
Scale : 1" = 20'-0"

R2= Two-family Residential District
B4= General Business District

Parcel ID :	21000605.
Parcel Address :	14615 E JEFFERSON AVE
Site City:	DETROIT
Site Zip:	48215-2966
Parcel ID :	21000604.
Parcel Address :	1000 PHILIP
Site City:	DETROIT
Site Zip:	48215-2966

PROJECT:
Renovation
Car Wash

LOCATION:
14615 Jefferson Avenue
Detroit , Michigan

A & M CONSULTANTS
835 MASON,STE. B290
DEARBORN, MI-48124
PH:(313) 582-0022
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DRAWN BY:
Ahmad Habli

APPROVED BY:
ADNAN AL-SAATI

SUBMITTALS

REVISIONS:

PROJECT NO
25-102
DATE
02/05/2025
SCALE
NOTED
SHEET TITLE
EXISTING SITE PLAN

A-02

SEAL
STATE OF MICHIGAN
ADNAN H AL-SAATI
ENGINEER
No. 6201038105
LICENSED PROFESSIONAL ENGINEER

PROPERTY DESCRIPTION(Parcel ID): 21000604
N--E JEFFERSON 1 W 11.84 FT 2 FOX CREEK SUB L25
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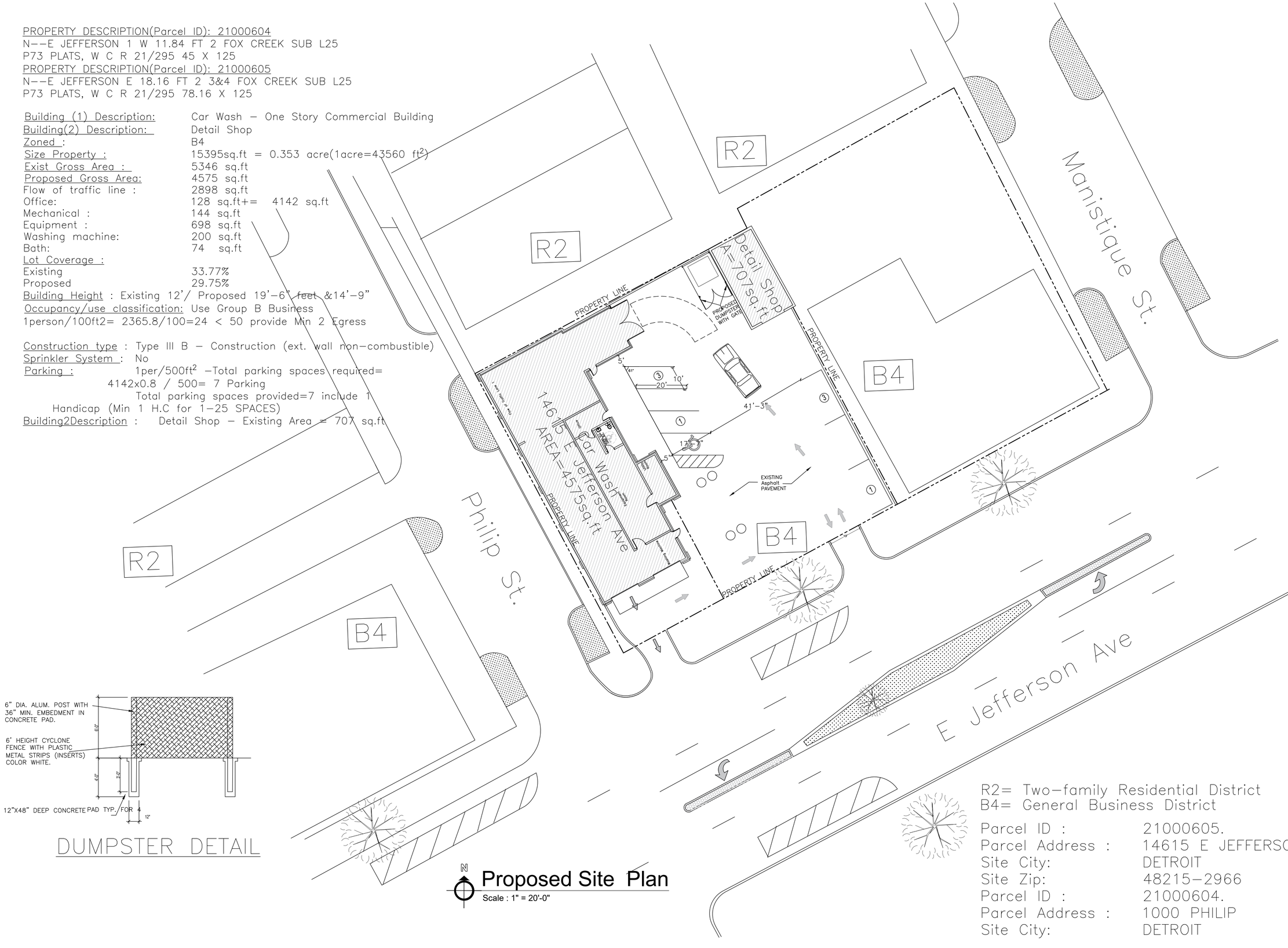


DUMPSTER DETAIL

N
Proposed Site Plan
Scale : 1" = 20'-0"

R2= Two-family Residential District
B4= General Business District

Parcel ID :	21000605.
Parcel Address :	14615 E JEFFERSON AVE
Site City:	DETROIT
Site Zip:	48215-2966
Parcel ID :	21000604.
Parcel Address :	1000 PHILIP
Site City:	DETROIT

PROJECT:
Renovation
Car Wash

LOCATION:
14615 Jefferson Avenue
Detroit , Michigan

A & M CONSULTANTS
835 MASON,STE. B290
DEARBORN, MI-48124
PH:(313) 582-0022
FAX:(313) 582-0028

DRAWN BY:
Ahmad Habli

APPROVED BY:
ADNAN AL-SAATI

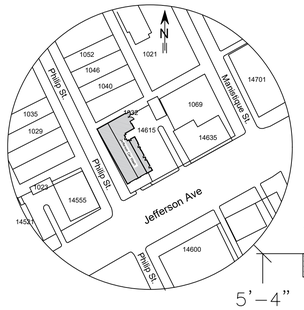
SUBMITTALS

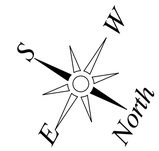
REVISIONS:

PROJECT NO
25-102
DATE
02/05/2025
SCALE
NOTED
SHEET TITLE
PROPOSED SITE PLAN

A-03

SEAL
STATE OF MICHIGAN
ADNAN H AL-SAATI
ENGINEER
No. 6201038125
REGISTERED PROFESSIONAL ENGINEER





105’–1”

104’

5’–4”

11’–5”

9’–1”

10’

12’–9”

36’–7”

34’–3”

57’–4”

59’–8”

31’

17’

24’–4”

19’–7”

19’

11’

12’–3”

17’–2”

1’–2”

SAW CUT REMOVE EXISTING PARTITION
FULL HEIGHT&BRICK WALL.
REMOVE METAL DOOR AND FRAME

SAW CUT REMOVE EXISTING
MASONRY BLOCK FULL HEIGHT.
REMOVE METAL DOOR AND FRAME

Demolition Floor Plan

Scale : 1/4" = 1'-0"

WALL LEGEND

- EXISTING MASONRY BLOCK WALL
- EXISTING MASONRY BRICK ON BLOCK WALL
- REMOVE, EXISTING MASONRY BLOCK WALL
- REMOVE, EXISTING MASONRY BRICK ON BLOCK WALL
- REMOVE, EXISTING MASONRY BRICK WALL AND EXISTING PARTITION

PROJECT:

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Car Wash

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Detroit , Michigan

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25-102

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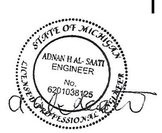
02/05/2025

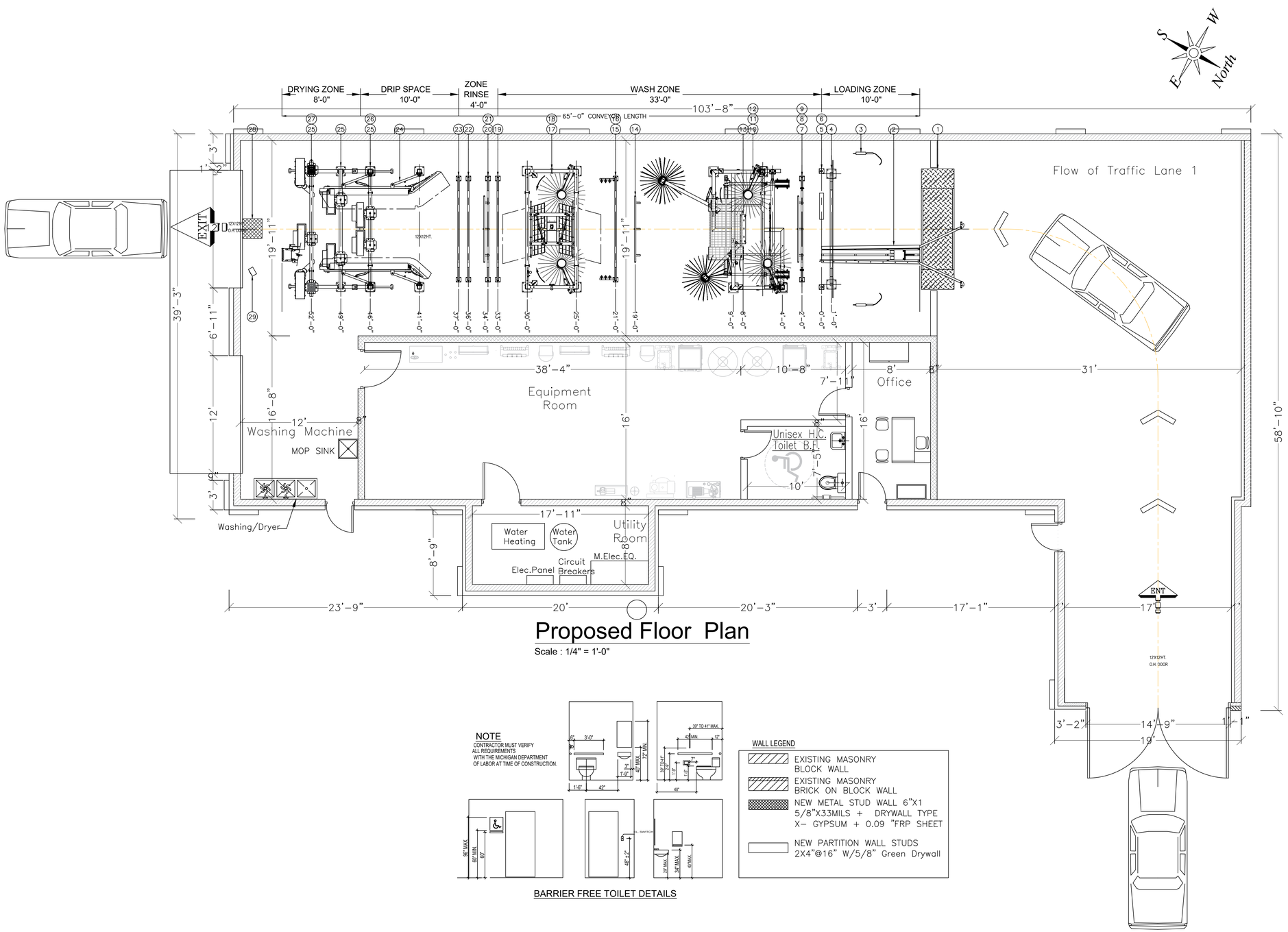
SCALE
NOTED

SHEET TITLE
DEMOLITION FLOOR PLAN

A-04

SEAL





Proposed Floor Plan

Scale : 1/4" = 1'-0"

BARRIER FREE TOILET DETAILS

PRIMARY EQUIPMENT

1. C-3D CORRELATOR
2. 65' CONVEYOR LENGTH
3. DUAL PREP GUNS
4. ULTIMATE GRAND ENTRY ARCH
5. ENTRY EYES
6. ELECTRONIC SENSOR PAD
7. ECONO ARCH – PRESOAK
8. RAIN OF FOAM – PRESOAL
9. CTA – FOAMING TIRE & WHEEL APPLICATOR
10. SHORT STACK FLEX WRAP
11. TOP BRUSH ATTACHMENT /SHORT STACK
12. H.C.R.P. 21"
13. UNDERCARRIAGE APPLICATOR
14. (3) ROW RAIN MANIFOLD
15. 2x2 ARCH – RAIN OF FOAM – WAX
16. TRIPLE FOAM APPLICATOR
17. HANNA FINISHING TOUCH MITTER
18. H.C.R.P. 28"
19. ECONO ARCH – RINSE
20. ECONO ARCH – CLEAR COAT
21. (1) ROW DRYING AGENT
22. ECONO ARCH – CERAMIC
23. ECONO ARCH – SPOT FREE
24. HANNA TIRE GLAZE APPLICATOP
25. 7 AIR DRYERS
26. DUAL NOZZLE
27. SPIDER FIN NOZZLE /PAIR
28. COLLISION AVOIDANCE PAD
29. WAIT / GO EXIT TRAFFIC LIGH

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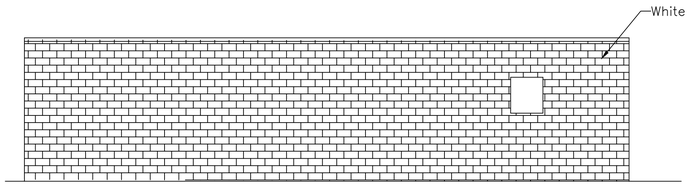
SHEET TITLE

PROPOSED FLOOR PLAN
W/ Equipments

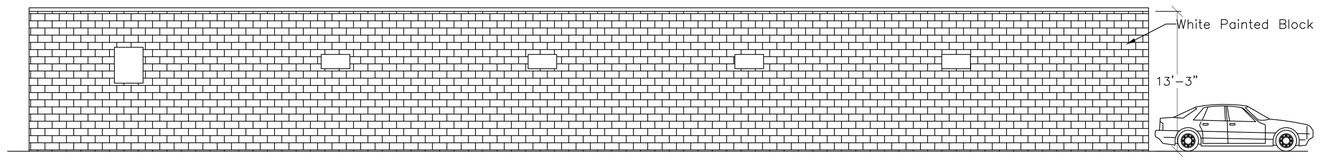
A-05

SEAL



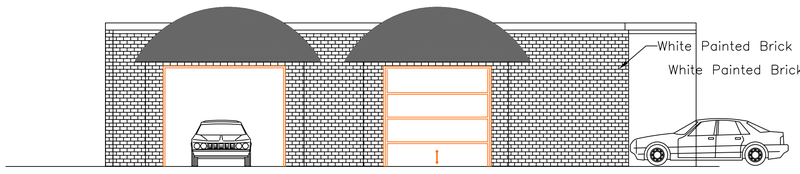
Existing North Elevation

Scale : 1/4" = 1'-0"



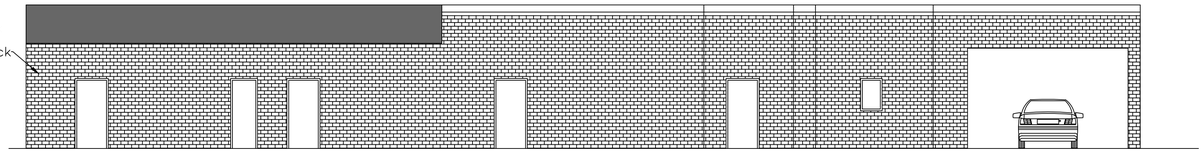
Existing West Elevation

Scale : 1/4" = 1'-0"



Existing South Elevation

Scale : 1/4" = 1'-0"



Existing East Elevation

Scale : 1/4" = 1'-0"

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Car Wash

LOCATION:

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Detroit , Michigan

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APPROVED BY:

ADNAN AL-SAATI

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DATE
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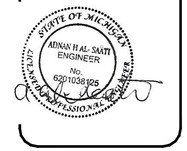
SCALE
NOTED

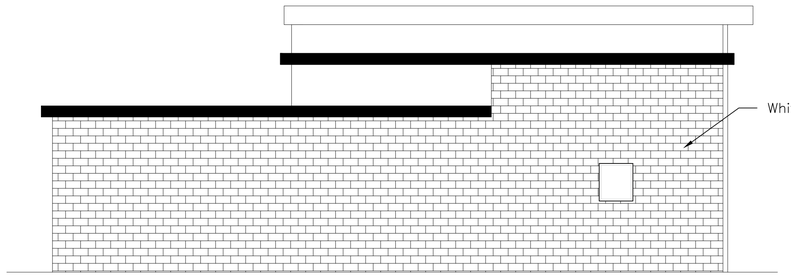
SHEET TITLE

EXISTING ELEVATIONS

A-06

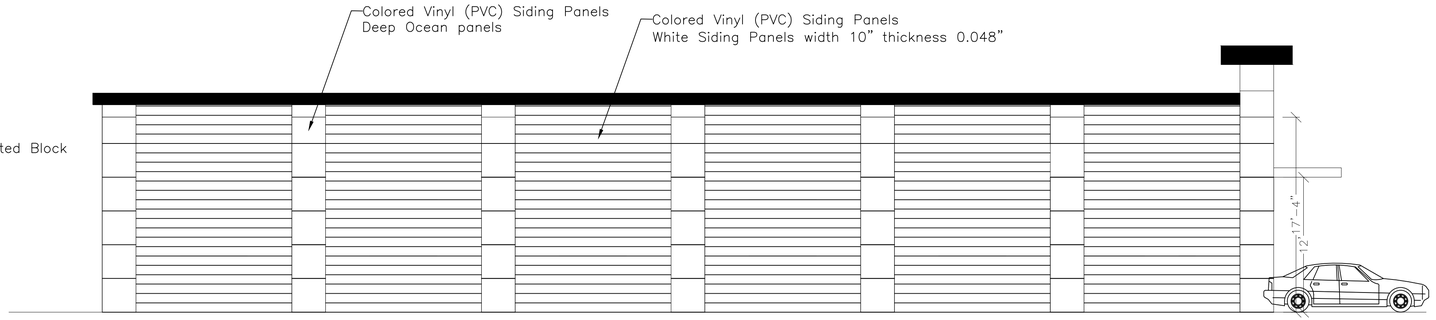
SEAL





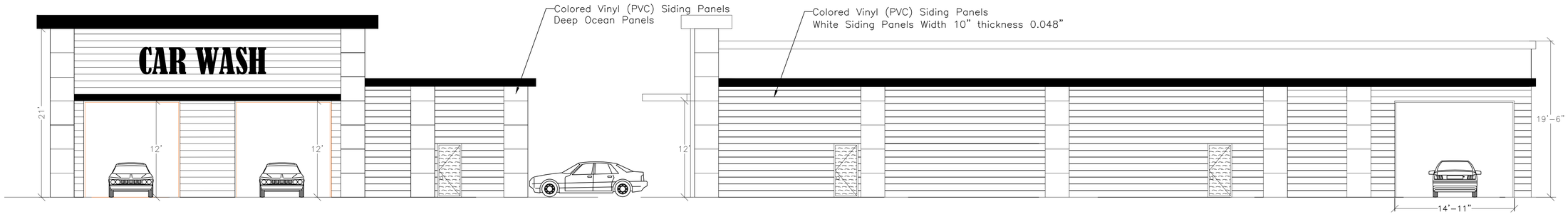
Proposed North Elevation

Scale : 1/4" = 1'-0"



Proposed Elevation

Scale : 1/4" = 1'-0"

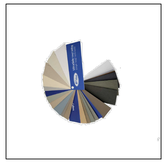


Proposed South Elevation

Scale : 1/4" = 1'-0"

Proposed East Elevation

Scale : 1/4" = 1'-0"



Specification of Colored Vinyl (PVC) Siding Panels

1. General Material Properties
Material: Polyvinyl Chloride (PVC)
Composition: UV-stabilized, impact-resistant vinyl with added color pigmentation
Finish: Smooth or wood-grain texture, pre-colored (no painting required)
Color Options: Navy Blue, Pacific Blue, Royal Blue, Deep Ocean Blue (varies by manufacturer)

2. Panel Dimensions & Thickness
Panel Width: 10"
Panel Length: 8', 10', 12', 16', 20' (Custom sizes available)
Thickness: 0.048"
Locking System: Interlocking or tongue-and-groove panels

3. Durability & Performance Ratings
Weather Resistance: Withstands extreme temperatures (-40°F to 140°F)
Waterproof & Mold-Resistant: Yes, does not absorb moisture
UV Protection: Yes, fade-resistant with built-in UV inhibitors
Impact Resistance: Moderate (ASTM D4226 compliant)
Fire Rating: Class A or B (ASTM E84)
Wind Load Resistance: 110 – 160 mph (varies by manufacturer)

4. Installation & MaintenanceInstallation Method:
Nailed, clipped, or fastened to furring strips or sheathingMaintenance:
Easy to clean with soap & water or pressure washer
No need for painting or sealing
Resistant to rust, corrosion, and rot5.

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Detroit , Michigan

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Ahmad Habli

APPROVED BY:
ADNAN AL-SAATI

SUBMITTALS

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DATE
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SCALE
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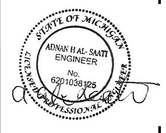
SHEET TITLE

PROPOSED ELEVATIONS

A-07

SEAL



1- DEAD LOADS:
SINGLE PLY RUBBER ROOFING2 PSF
RIGID INSULATION 1.5" 1 PSF
20 GA METAL DECK 1.5" 2 PSF
OWN WEIGHT TRUSS 6 PSF

2- LIVE LOAD : 20 PSF

3- SNOW LOAD : 30 PSF

4- WIND UPLIFT: 15 PSF

5- MECHANICAL EQ. AVR.: 900 LB

TOTAL LOAD COMBINATION :
= D+L+S+0.75W=11+20+30+0.75x15= 72.24~=75PSF

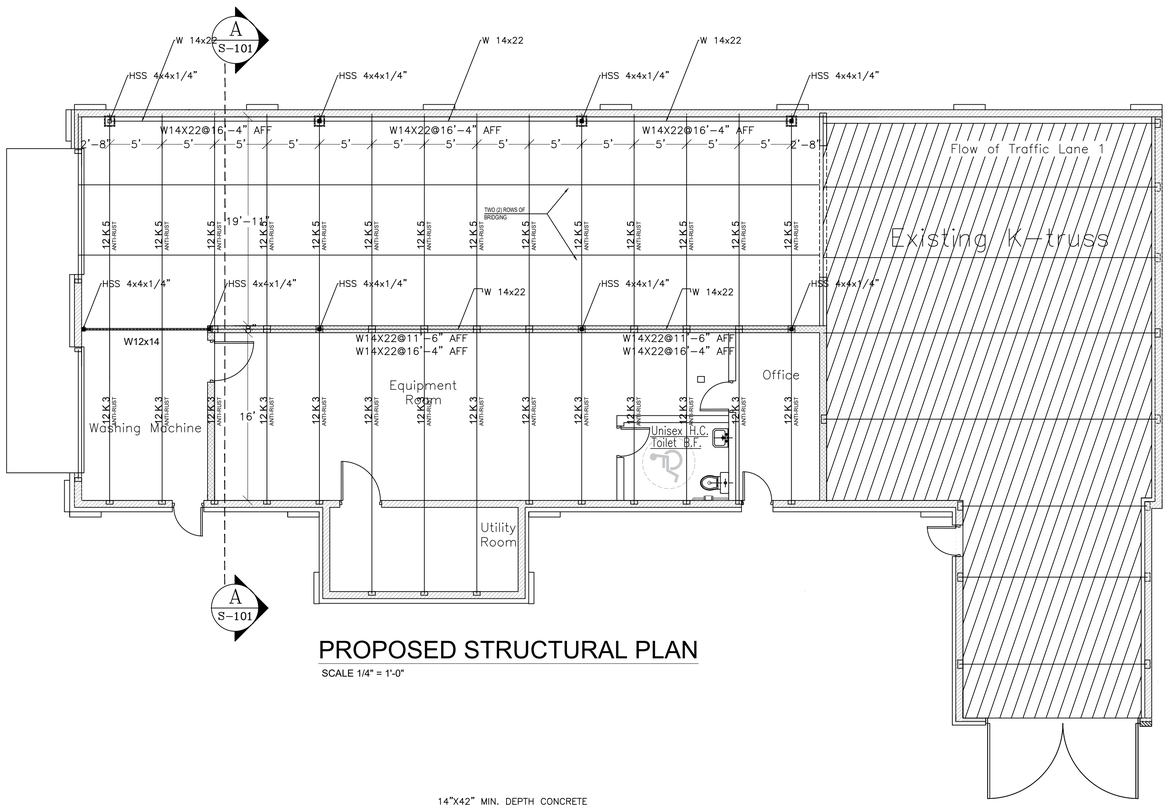
FOR TRUSS JOIST SPACING 5 FEET
W=75X5=375 PLF

FROM TABLE ASD SERIES K --- FOR SPAN 20 FEET WE GET :
12K5

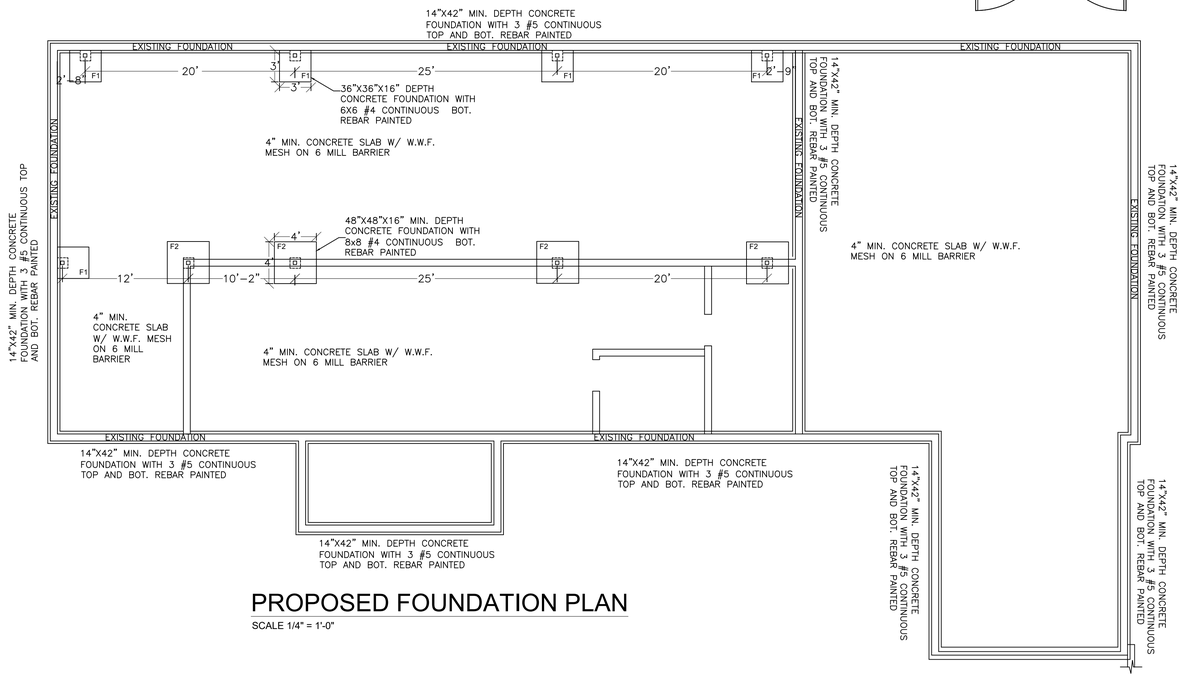
FOR SPAN 16 FEET W/MECHANICAL EQUIPMENT
TL=475 PLF --- WE GET : 12K3

FROM TABLE ASD SERIES K --- FOR SPAN 28 FEET WE GET :
16K9

1. PROVIDE TEMPORARY BRACING AS REQUIRED TO INSURE THE STABILITY OF THE STRUCTURE UNTIL THE PERMANENT FRAMING IS IN PLACE. VERIFY EXACT SIZE AND LOCATION OF ALL FLOOR AND ROOF OPENINGS WITH MECHANICAL AND PLUMBING CONTRACTOR. STEEL CONTRACTOR TO PROVIDE PROPER STRUCTURAL SUPPORTS FOR HVAC UNITS, FANS, ETC. , COORDINATE WITH MECHANICAL CONTRACTOR. REFER TO OTHER DRAWINGS FOR MISCELLANEOUS STEEL ANGLES, BARS, PLATES, ETC., ATTACHED TO STRUCTURAL STEEL.
2. THE STRUCTURAL INTEGRITY OF THE BUILDING SHOWN ON THESE PLANS IS DEPENDENT UPON THE COMPLETION ACCORDING TO PLANS AND SPECIFICATIONS. STRUCTURAL MEMBERS ARE NOT SELF BRACING UNTIL PERMANENTLY AFFIXED TO THE STRUCTURE AS DIRECTED. THE ENGINEER/ ARCHITECT ASSUME NO LIABILITY FOR THE STRUCTURE DURING CONSTRUCTION UNLESS THE CONSTRUCTION METHOD OF BRACING ARE INCLUDED IN THE PLANS AND SPECIFICATIONS OR ARE SUPERVISED THE ENGINEER/ ARCHITECT DURING CONSTRUCTION.



PROPOSED STRUCTURAL PLAN
SCALE 1/4" = 1'-0"



PROPOSED FOUNDATION PLAN
SCALE 1/4" = 1'-0"

STEEL NOTES

1- THE FOLLOWING LOADS WERE USED IN THE DESIGN: SNOW LOAD = 30 P.S.F., WITH ADJUSTMENTS FOR ROOF HEIGHTS. WIND LOAD BASED ON 115 M.P.H. WIND SPEED AND BOCA LATEST EDITION.
2- ALL STRUCTURAL STEEL SHALL CONFORM TO THE LATEST ASTM SERIAL DESIGNATION, ROLLED SHAPES- ASTM A 36, TUBING- ASTM A500 GRADE B OR C, FY = 46 K.S.I. ALL STEEL TO HAVE ONE SHOP COAT OF RUST INHIBITIVE PAINT, STEEL DESIGN, FABRICATION AND ERICTION IS TO BE INACCORDANCE WITH THE LATEST A.I.S.C. AND A.W.S. SPECIFICATIONS.
3- ALL FIELD CONNECTIONS TO BE MADE WITH ASTM 325- 3/4" DIA. H.S. BOLTS OR EQUIVALENT WELDS. SHOP CONNECTION TO BE WELDED ASTM A233 CLASS E70 ELECTRODES IN ACCORDANCE WITH A.I.S.C. AND A.W.S. SPECIFICATIONS.
4- STEEL JOISTS TO BE FABRICATED BY MEMBER OF STEEL JOIST INSTITUTE AND ERECTED IN ACCORDANCE WITH THE LATEST SPECIFICATION. STEEL JOISTS BEARING ON STEEL BEAM OR PLATES, TO BE WELDED TO STEEL WITH 2" LONG BEAD ON EACH SIDE OF BEARING. EXTEND BOTTOM CHORD OF JOISTS AT COLUMNS AND CONNECT. ANY EQUIPMENT SUSPENDED FROM STEEL JOISTS SHALL BE FROM THE TOP CHORD OF PANEL POINTS. VERIFY ALLOWABLE LOADS WITH THE STEEL JOIST INSTITUTE.
5- ROOF DECK TO BE 1 1/2", 20GA.. PAINTED METAL, THREE SPAN UNITS WITH FY= 33 K.S.I.
6- ALL WALL BEARING STEEL BEAMS AND LINTELS TO BEAR A MINIMUM ** ON 3-COURSES HIGH BY 2' - 8" WIDE SOLID MASONRY, TYPE N MORTAR, WITH TWO 3/4" DIA. ANCHOR BOLTS, ASTM A 325, AT EACH END UNLESS OTHERWISE NOTED.
7- PROVIDE TEMPORARY BRACING AS REQUIRED TO INSURE THE STABILITY OF THE STRUCTURE UNTIL THE PERMANENT FRAMING IS IN PLACE. VERIFY EXACT SIZE AND LOCATION OF ALL FLOOR AND ROOF OPENINGS WITH MECHANICAL AND PLUMBING CONTRACTOR. STEEL CONTRACTOR TO PROVIDE PROPER STRUCTURAL SUPPORTS FOR HVAC UNITS, FANS, ECT. , COORDINATE WITH MECHANICAL CONTRACTOR. REFER TO OTHER DRAWINGS FOR MISCELLANEOUS STEEL ANGLES, BARS, PLATES, ECT., ATTACHED TO STRUCTURAL STEEL.
8- THE STRUCTURAL INTEGRITY OF THE BUILDING SHOWN ON THESE PLANS IS DEPENDENT UPON THE COMPLETION ACCORDING TO PLANS AND SPECIFICATIONS. STRUCTURAL MEMBERS ARE NOT SELF BRACING UNTIL PERMANENTLY AFFIXED TO THE STRUCTURE AS DIRECTED. THE ENGINEER/ ARCHITECT ASSUME NO LIABILITY FOR THE STRUCTURE DURING CONSTRUCTION UNLESS THE CONSTRUCTION METHODE OF BRACING ARE INCLUDED IN THE PLANS AND SPECIFICATIONS OR ARE SUPERVISED THE ENGINEER/ ARCHITECT DURING CONSTRUCTION.

CONCRETE NOTES:-

1- FOOTINGS ARE DESIGNED FOR A SOIL BEARING PRESSURE OF 2500 PSF.
2- ALL CONCRETE SLABS, FOOTINGS, FOUNDATION WALLS AND PIERS SHALL DEVELOPE A COMPRESSIVE CONCRETE STRENGTH OF 3500 PSI @ 28 DAYS, WITH 6%, +/-1% ENTRAINED AIR WHERE EXPOSED TO WEATHER. CONCRETE WORK AND PLACEMENT SHALL CONFORM TO THE SPECIFICATIONS OF THE ACI LATEST ADDITION. ALL FILL UNDER SLAB SHALL BE 4" MIN.CLEAN GRANULAR SAND COMPACTED TO A MINIMUM OF 95% MODIFIED PROCTOR.
3- ALL FABRICATION AND ERECTION OF REINFORCED BARS SHALL FOLLOW THE ACI MANUAL "STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES" ACI 315 LATEST A 318). REINFORCING BARS ARE TO BE INTERMEDIATE GRADE, PERFORMED, NEW BILLET STEEL MEETING ASTM A15 (LATEST EDITION). ASTM A615 GRADE 60. ALL REINFORCING STEEL SHALL HAVE A MINIMUMM 36 BAR DIAMETER LAP. WELDED WIRE FABRIC MUST HAVE END LAPS OF ONE FULL MESH AND CONFORM TO ASTM A185-75.
4- PROVIDE (4) #5 CORNER BARS (2'-0" X 2'-0") AT ALL INTERSECTIONS AND CORNERS OF FOUNDATION WALLS (2 TOP AND 2 BOTTOM).
5- PROVIDE DOWELS BETWEEN ALL FOOTINGS, WALLS, AND PIERS TO MATCH SIZE AND SPACING OF VERTICAL REINFORCING.
6- ALL BLOCK SHALL BE TYPE N-1, MORTAR SHALL BE TYPE S, HORIZONTAL WIRE REINFORCING SHALL BE AT 16" O.C. VERTICAL IN ALL MASONRY WALLS.
7- FOR MASONRY OPENINGS FURNISH ONE 3 1/2" X 3 1/2" X 5/16" ANGLE FOR EACH 4" OF WALL THICKNESS FOR SPANS UP TO 5'-0", UNLESS OTHERWISE NOTED.
8- PROVIDE TEMPORARY BRACING AS REQUIRED TO INSURE THE STABILITY OF THE STRUCTURE UNTIL THE PERMANENT STRUCTURE IS IN PLACE.
9- VERIFY EXACT SIZE AND LOCATION OF ALL FLOOR AND ROOF OPENINGS WITH MECHANICAL AND PLUMBING CONTRACTORS.

PROJECT:

Renovation
Car Wash

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Detroit , Michigan

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DRAWN BY:
Ahmad Habli

APPROVED BY:
ADNAN AL-SAATI

SUBMITTALS

REVISIONS:

PROJECT NO
25-102
DATE
02/05/2025
SCALE
NOTED

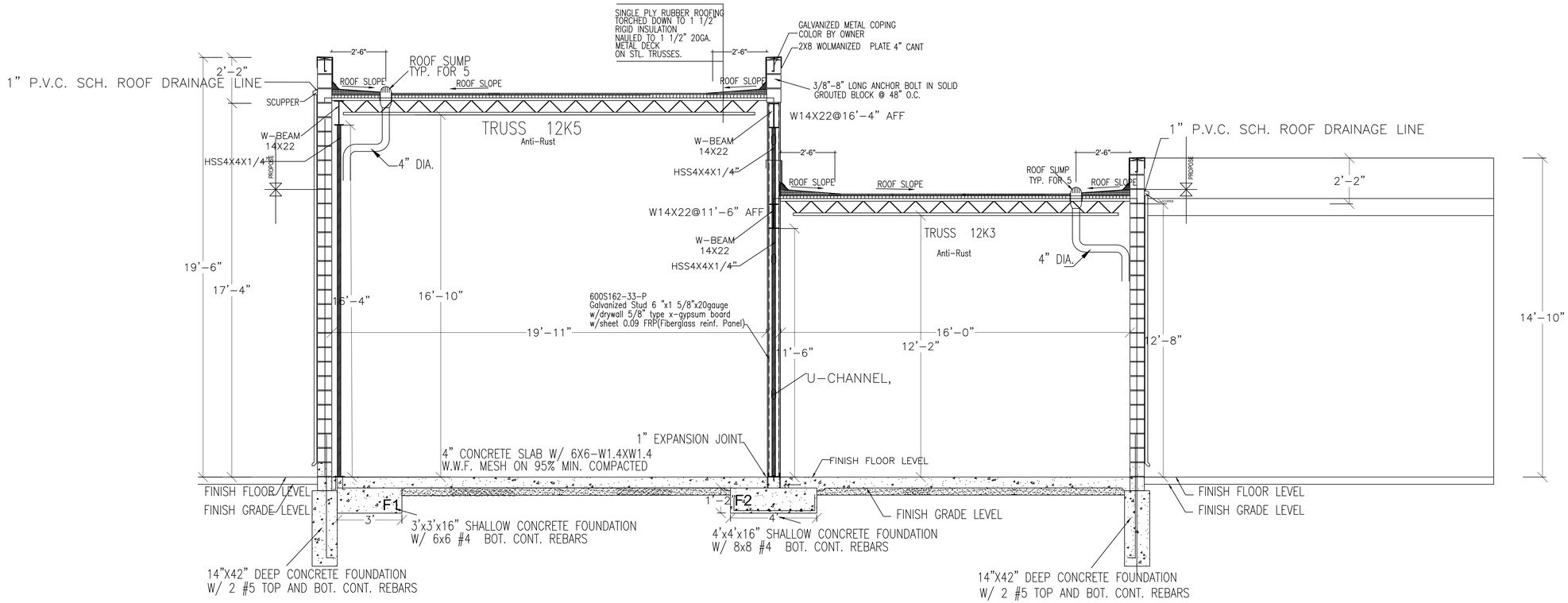
SHEET TITLE

PROPOSED STRUCTURE PLAN
PROPOSED FOUNDATION PLAN

A-08

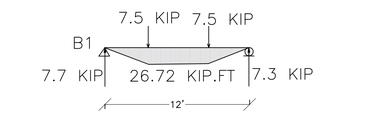
SEAL

STATE OF MICHIGAN
ADNAN H AL-SAATI
ENGINEER
No.
6201038325
PROFESSIONAL ENGINEER

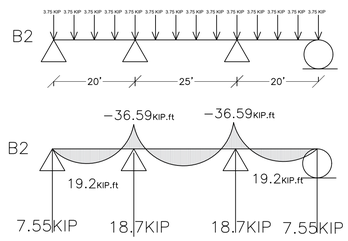


CROSS SECTION A-A AT STEEL TRUSS

SCALE 1/2" = 1'-0"



1-STEEL BEAM 1-SPAN 12' USE W12x14



2-STEEL BEAM 2-SPAN 25' USE W14x22

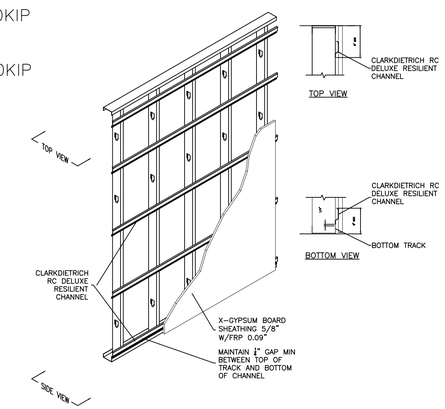
3-STEEL Column -Height 16'-11" USE HSS4x4x1/4" -20KIP/40KIP

4-SPREAD FOOTING F1 -DEPTH16" USE 36"X36" W/6x6#4- 20KIP

5-SPREAD FOOTING F2 -DEPTH16" USE 48"X48" W/8x8#4- 40KIP

6- Design Bearing Wall:
Lateral load: 7.5 psf
Deflection: L/360
Limiting height: 17ft
Assembly
Stud web width: 6"
Stud Flange: S162 (1-5/8")
Stud spacing: 16"
Punched
600S162-33-P
S162 (1-5/8" Flange Structural Stud) Punched
33mils (20ga) 33ksi

Interior Walls w/ Structural Framing at 7.5 psf
Limiting Height
Spacing L/360
16 19'-10"



RESILIENT CHANNEL APPLICATION DETAIL
RC DELUXE

1- DEAD LOADS:

SINGLE PLY RUBBER ROOFING	2 PSF
RIGID INSULATION 1.5"	1 PSF
20 GA METAL DECK 1.5"	2 PSF
OWN WEIGHT TRUSS	6 PSF
2- LIVE LOAD :	20 PSF
3- SNOW LOAD :	30 PSF
4- WIND UPLIFT:	15 PSF
5- MECHANICAL EQ. AVR.:	900 LB

TOTAL LOAD COMBINATION :
= D+L+S+0.75W=11+20+30+0.75x15= 72.24~=75PSF

FOR TRUSS JOIST SPACING 5 FEET
W=75X5=375 PLF

FROM TABLE ASD SERIES K --- FOR SPAN 20 FEET WE GET : 12K5

FOR SPAN 16 FEET W/MECHANICAL EQUIPMENT
TL=475 PLF --- WE GET : 12K3

FROM TABLE ASD SERIES K --- FOR SPAN 28 FEET WE GET : 16K9

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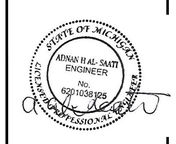
DATE
02/05/2025

SCALE
NOTED

SHEET TITLE
CROSS SECTION A-A

A-09

SEAL



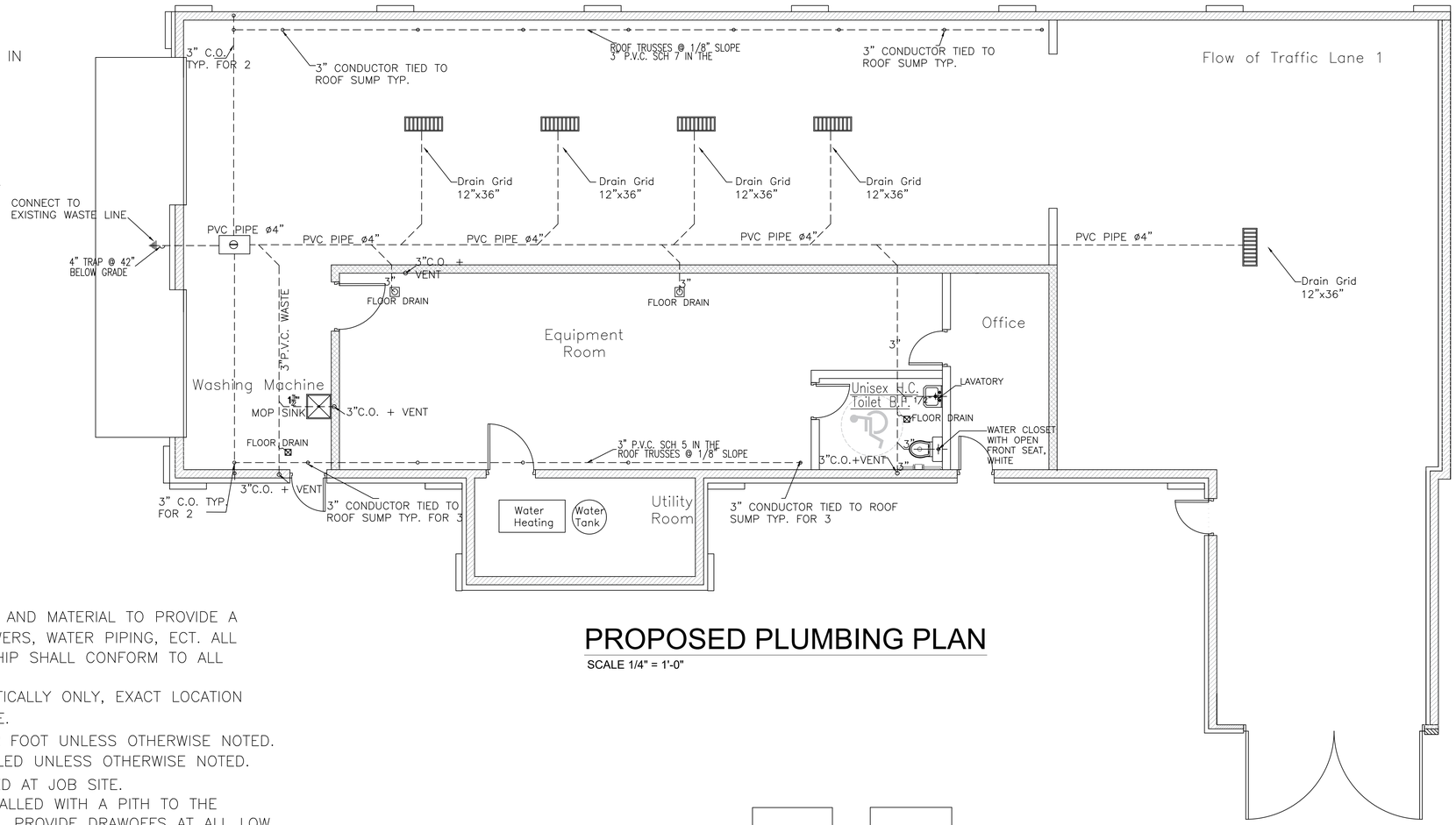
NOTE:

- ALL PLUMBING WORK SHALL BE CONDUCTED BY A LICENSED PLUMBER IN ACCORDANCE WITH LATEST PLUMBING CODE (2021).
- NEW $1\frac{1}{2}$" UNDERGROUND SEWER LINE SHALL HAVE $\frac{1}{4}$" PER 1' SLOPE

—Typical car wash tunnel uses a substantial amount of water. use, car wash moderate drain use 100 gallons per minute (GPM)

—Required Drain Length=25GPM/ft/ 100GPM=4linear feet of drain

—Typical Grill Drain Section Size: Often, each grill drain section is around 1 to 3 feet in length. Let's assume 1.5 feet per section for calculation.
Number of Grill Drains=4linear feet/ 1 feet per section= 4grill drains



PROPOSED PLUMBING PLAN

SCALE 1/4" = 1'-0"

PLUMBING NOTES:———

1— FURNISH ALL LABOR , EQUIPMENT AND MATERIAL TO PROVIDE A COMPLETE SYSTEM OF PLUMBING, SEWERS, WATER PIPING, ECT. ALL PLUMBING MATERIALS AND WORKMANSHIP SHALL CONFORM TO ALL STATE AND LOCAL CODES.

2— ALL PIPING IS SHOWN DIAGRAMMATICALLY ONLY, EXACT LOCATION WILL BE DETERMINED AT THE JOB SITE.

3— PITCH ALL DRAIN LINES 1/8" PER FOOT UNLESS OTHERWISE NOTED.

4— ALL PLUMBING SHALL BE CONCEALED UNLESS OTHERWISE NOTED.

5— ALL ELEVATIONS SHALL BE VERIFIED AT JOB SITE.

6— ALL WATER PIPING SHALL BE INSTALLED WITH A PITH TO THE DRAINS, PLUMBING CONTRACTOR SHALL PROVIDE DRAWOFFS AT ALL LOW POINTS. WATER PIPING SHALL BE GALVANIZED IRON OR TYPE "L" ABOVE GRADE AND TYPE "K" BELOW GRADE COPPER WITH SILFLOS JOINTS.

7— PROVIDE ALL REQUIRED SHUT— OFF VALVES, UNIONS AND FITTINGS, PROVIDE BALL VALVES AT ALL FOOD SERVICE EQUIPMENT.

8— HOT AND/ OR COLD WATER DROPS TO 2 OF MORE FIXTURES SHALL RUN FULL SIZE TO AIR CHAMBERS BEYOND THE FURTHEST FIXTURE BRANCH FROM DROPS. PROVIDE 12" AIR CHAMBERS AT ALL FIXTURES.

9— ALL HOT AND COLD WATER PIPING TO BE INSULATED. WRAP DOMESTIC COLD WATER WITH ANTI—SWEAT TAPE.

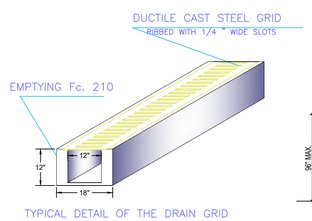
10— ALL PLUMBING AND SEWER TRENCHING, BACKFILLING AND SPECIAL CUTTING SHALL BE BY THIS CONTRACTOR. INTERIOR TRENCHES SHALL BE BACKFILLED WITH SAND. EXTERIOR TRENCHES, WHEN COMPLETED, SHALL HAVE THE SAME LOAD BEARING CAPACITY AS ADJACENT GRADES.

11— ALL WASTE AND SOIL PIPING SHALL BE GALVANIZES OR CAST IRON WHERE SUSPENDED. CAST IRON WHERE UNDERGROUND (P.V.C. ACCEPTABLE WHERE CODE PERMITS). VITRIFIED CLAY PIPE 5'—0" FROM BUILDING.

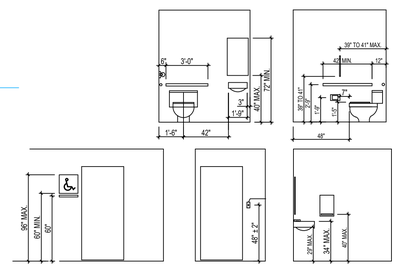
12— ALL P.V.C. PIPING SHALL BE SCHEDULE 40, EXCEPT WHERE NOTED.

13— ALL PIPING ABOVE THE CEILING TO BE OF NONCOMBUSTIBLE MATERIAL.

14— THIS CONTRACTOR SHALL GUARANTEE THAT ALL THE EQUIPMENT, MATERIALS AND WORKMANSHIP SHALL BE FREE FROM DEFECTS FOR A PERIOD OF ONE YEAR AFTER FINAL ACCEPTANCE.



TYPICAL DETAIL OF THE DRAIN GRID



PLUMBING FIXTURES NOTES

MOP SINK
FIAT MODEL #TSB—3010 24"X24"X12"
PROVIDE CHICAGO MODEL #835 SINK FAUCET
HAND SINK
WALL MOUNTED S.S. SINK
WATER HEATER
SMITH 75 GAL WATER HEATER
WATER CLOSET
AMERICAN STANDARD 2168.128 ELONGATED SIPHON ACTION W/ OL SONITE #95 SEAT—OPEN FRONT, WHITE
LAVATORY
BRIGGS MOD #6640 20"W 17"D
FAUCET BRIGGS BRASSWARE MOD #115WB
PROVIDE TEP. VALVE FOR H.C. LAV HOT WATER

PROJECT:

Renovation
Car Wash

LOCATION:

14615 Jefferson Avenue
Detroit , Michigan

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APPROVED BY:
ADNAN AL-SAATI

SUBMITTALS

REVISIONS:

PROJECT NO
25-102
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SCALE
NOTED

SHEET TITLE
Proposed Plumbing Plan

A-10

SEAL

STATE OF MICHIGAN
ADNAN H AL-SAATI
ENGINEER
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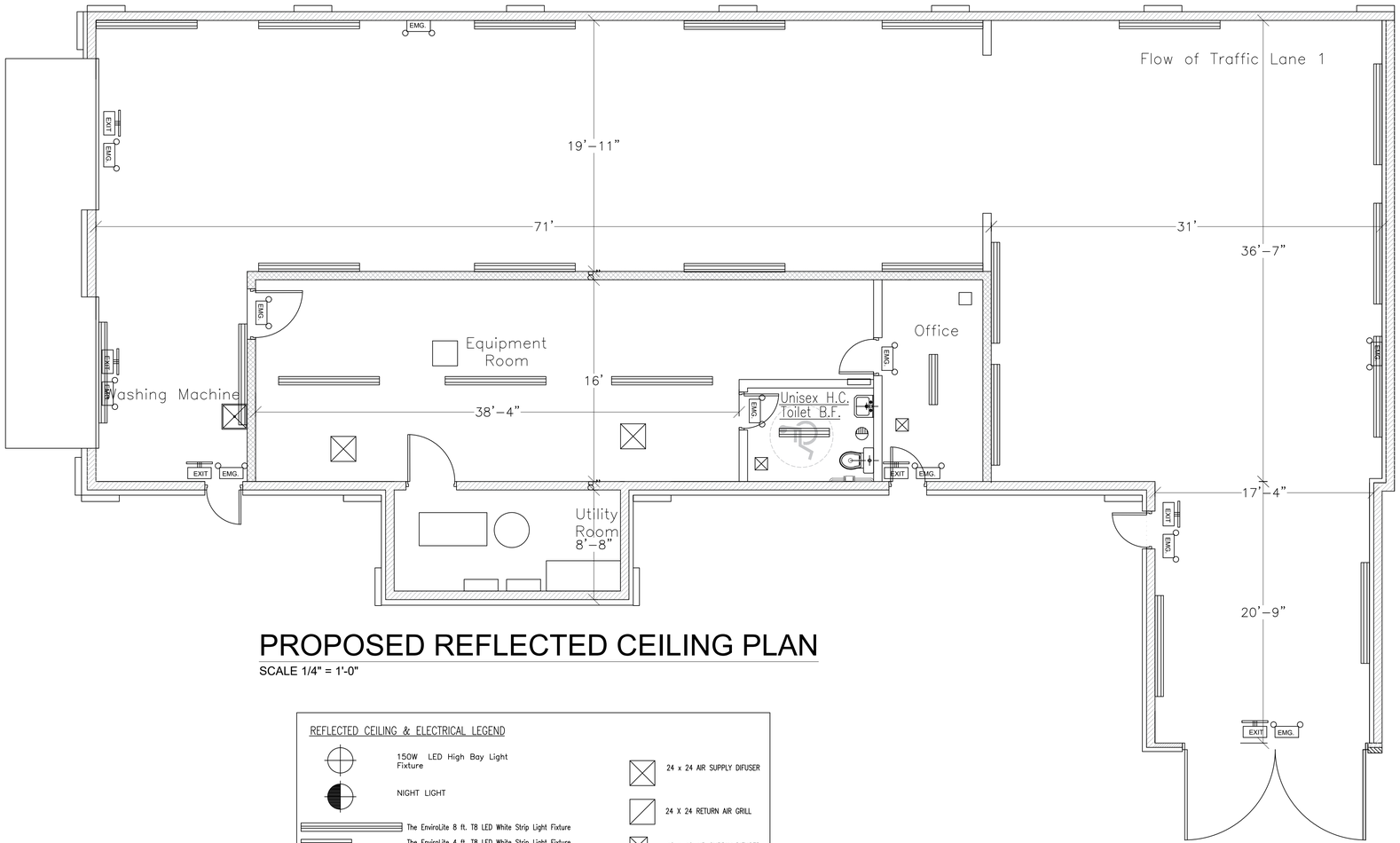

PROPOSED REFLECTED CEILING PLAN

SCALE 1/4" = 1'-0"

REFLECTED CEILING & ELECTRICAL LEGEND

- 150W LED High Bay Light Fixture
- NIGHT LIGHT
- The EnviroLite 8 ft. T8 LED White Strip Light Fixture
- The EnviroLite 4 ft. T8 LED White Strip Light Fixture
- 18"x48" WRAP AROUND FLOURESCENT LIGHT FIXTURE T-8, 4-32W ACRYLIC LENS 142W.
- NIGHT LIGHT FIXTURE
- EXIT STANDARD ,WALL MOUNTED EXIT LIGHT FIXTURE W/ BACK-UP BATTERY
- EMG. STANDARD,WALL MOUNTED EMERGENCY LIGHT FIXTURE W/ BACK-UP BATTERY
- 24 x 24 AIR SUPPLY DIFUSER
- 24 X 24 RETURN AIR GRILL
- 12 x 12 AIR SUPPLY DIFUSER
- 12 X 12 RETURN AIR GRILL
- 12X6 RETURN AIR GRILL
- 12X6 AIR SUPPLY GRILL
- 100 CFM EXAUST FAN

NOTES:

-ALL ELECTRICAL WORK SHALL BE CONDUCTED BY A LICENSED ELECTRICIAN IN ACCORDANCE WITH LATEST ELECTRICAL CODE (2023 National Electrical Code (NEC).

-This is Primary Calculation
For a car wash tunnel, we previously estimated that 75 lumens/ft² is a reasonable target.
Required Lumens=
3231ft2×75lumens/ft2=242,325lumens

-Lumens per fixture: 13,600 lumens
Number of fixtures required:
242,325÷13,600≈18 fixtures
Final Recommendation:
Use 18 fixtures of T8, 2-lamp, 8-ft type.
Two-row staggered layout (9 fixtures per row).
Spacing: Approximately 8.5-9 feet apart in each row.

-Target illumination: 75 lumens/ft²
Total area: 14 ft × 38 ft = 532 ft²
Required lumens:
532×75=39,900 lumens
2. Determine Number of Fixtures
Each fixture provides: 13,600 lumens
Required fixtures:
39,900÷13,600≈3 fixtures

-Choose The EnviroLite 8 ft. T8 LED White Strip Light Fixture is designed for commercial and industrial applications, offering energy efficiency and durability.

Key Specifications:
Dimensions: 96 inches (length) x 4.43 inches (width) x 2.1 inches (height)
Weight: Approximately 12.5 lbs
Voltage: 120V to 277V multi-volt
Wattage: 56 watts
Lumen Output: 7,200 lumens
Color Temperature: Available in 4,000K and 5,000K options

PROJECT:

Renovation
Car Wash

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Detroit , Michigan

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SHEET TITLE

Proposed Reflected Ceiling Plan

A-11

SEAL

STATE OF MICHIGAN
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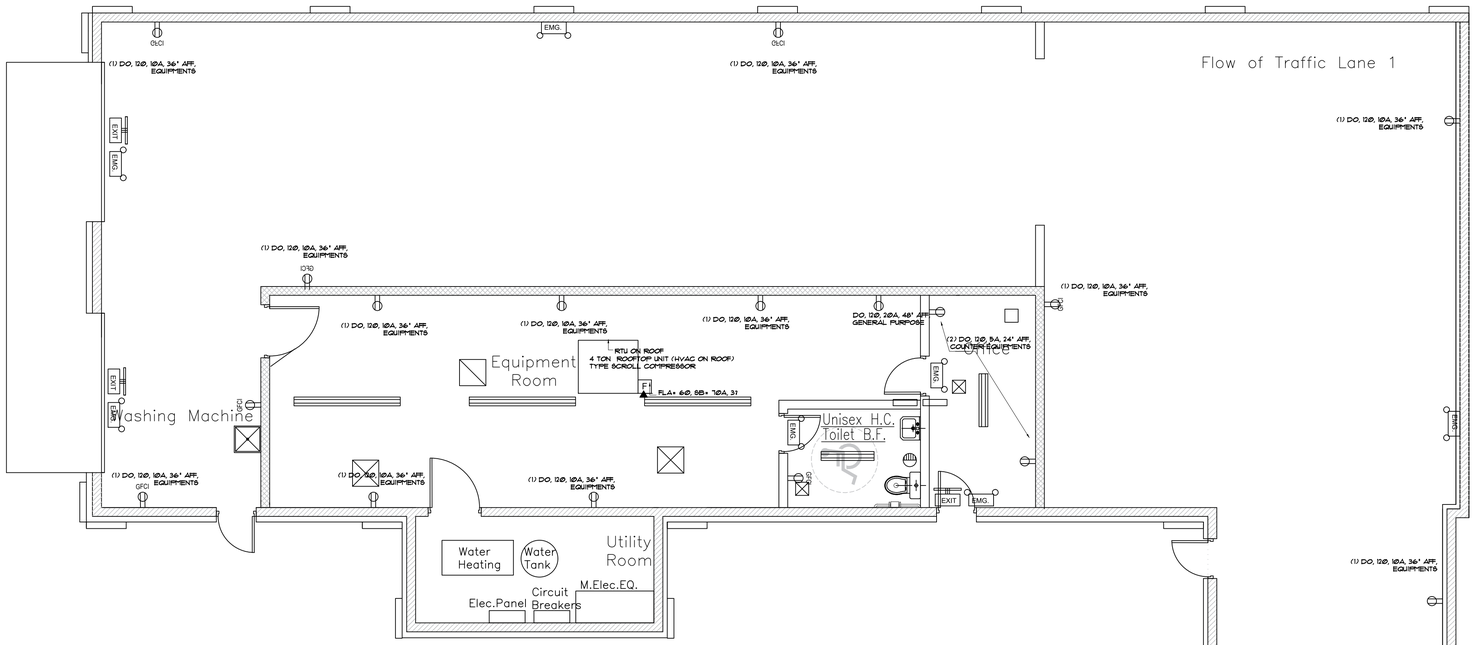


PROPOSED POWER PLAN / RISER DIAGRAM

SCALE 1/4" = 1'-0"

Electrical Load Calculation for Car Wash Project:

Three–Phase Loads (230V, 3–Phase)
Blowers (3 x 10 HP): 62.42 A
HVAC Compressor (4 Ton, 14.5 SEER): 39.24 A
Total Three–Phase Current: 101.66 A
Recommended Three–Phase Panel Size (with 125% NEC Rule): 127 A

Single–Phase Loads (230V, 1–Phase)

LED High Bay Fixtures (15 units, 150W each): 9.78 A
Wrap Fluorescent T–8 (3 units, 32W each): 0.42 A
Wall Mounted Fixtures (14 units, 60W each): 3.65 A
Receptacles (16 units, 180W each): 12.52 A
Total Single–Phase Current: 26.37 A
Recommended Single–Phase Panel Size (with 125% NEC Rule): 33 A

Main Panel Sizing:

A 150A, 3–phase panel should be used to accommodate future expansion and voltage drops.
A 40A single–phase sub–panel may be used for lighting and receptacles.
Circuit Breaker Recommendations:

Conveyor Motor:

A 65–foot conveyor in a commercial car wash typically requires between 10 to 30 HP.
Converted to kW: 10HP×0.746=7.46kW
30 HP×0.746=22.38 kW

Washing Equipment:

Pumps and Heaters: Approximately 10 kW.
Control Systems and Lighting:

Control Systems: Around 2–5 kW.
Lighting: Approximately 5–10 kW depending on the setup.

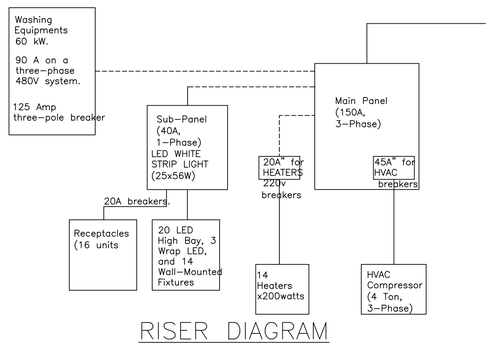
Total Power=22.38 kW+10 kW+5 kW+10 kW=47.38 kW

Adjusted Power=47.38 kW×1.25=59.225 kW

I=59.225/(1.732×480×0.8)≈0.089kAI
I≈89 A

Notes:
Ensure the wire's ampacity (current carrying capacity) is appropriate for the continuous load.
Use 75°C copper wire unless specified differently.
Check the length of the wire run: for longer distances, you might need to use larger wire to account for voltage drop.

Component	Current	Recommended Wire Size
Heaters	20A	#12 AWG
HVAC Compressor (4 Ton York – 3–Phase)	39.24A	#8 AWG
LED High Bay Fixtures (15 x 150W)	9.78A	#14 AWG
Wrap LED T–8 Fixtures (3 x 32W)	0.42A	#18 AWG
Standard Wall–Mounted Fixtures (14 x 60W)	3.65A	#14 AWG
Receptacles (16 x 180W)	12.52A	#12 AWG
Washing Equipments	90 A	# 4 AWG



RISER DIAGRAM

ELECTRICAL NOTES

– IT IS THE RESPONSIBILTY OF THE OWNER TO SUBMIT THESE PLANS FOR APPROVAL PRIOR TO START OF WORK.
– ALL MATERIAL AND WORKMANSHIP SHALL CONFORM TO THE REQUIREMENTS OF APPLICABLE BUILDING CODES AND ORDINANCES.
– CONTRACTORS SHALL OBTAIN AND PAY FOR ALL THE PERMIT FEES THAT ARE RELATED TO THEIR PART OF WORK.
– IT IS IMPORTANT FOR CONTRACTORS TO VISIT THE JOB SITE TO BECOME FAMILIAR WITH THE SCOPE OF WORK.
– PRIOR TO START OF WORK, CONTRACTORS TO CHECK AND VERIFY ALL DIMENSIONS ON THE FIELD, REPORT ANY ERRORS, OMISSIONS, OR POSSIBLE DISCREPANCIES TO THE OWNER/ OR ARCHITECT.
– ELECTRICAL CONTRACTOR SHALL VERIFY EXISTING SERVICE, CT BOX, PHASE, METER LOCATION AND SHALL PERFORM THE WORK TO MEET JOB REQUIREMENT AS PER CODE.
– THESE PLANS SHOW ROUGH–IN REQUIREMENTS FOR THE EQUIPMENTS DISCUSSED WITH OWNER AT THE START AND DURING THE DESIGN PROCESS. CONTRACTORS TO CHECK WITH OWNER FOR ANY CHANGES, SO THE SERVICE REQUIREMENTS ARE SIZED AND ROUGHED–IN PROPERLY.
– CONTRACTORS ARE RESPONSIBLE TO CHECK THE SPECIFICATION SHEETS OF ALL EQUIPMENTS TO BE USED ON THIS JOB, TO PROPERLY LOCATE THE ROUGH–IN LOCATION AND TO SUPPLY ALL FITTINGS NEEDED TO DO THE FINAL CONNECTIONS OF ALL EQUIPMENTS.
– ALL SERVICES SHOWN WITH SYMBOLS CENTERED ON FACE OF WALL, SERVICE BROUGHT TO THAT POINT CONCEALED IN WALL STUBBED OUT OF FLOOR CENTERED AT HEIGHT SHOWN. DO NOT STUB OUT OF FLOOR AND RUN EXPOSED ON FACE OF WALL.
– ALL SERVICES SHOWN WITH SYMBOLS AWAY FROM ANY WALL OR COLUMN SHOULD BE STUBBED OUT OF FLOOR TO A MAXIMUM OVERALL HEIGHT AS SHOWN.

ELECTRICAL ABBREVIATIONS & SYMBOLS

E.C.	▼	ELECTRICAL CONNECTION – CONDUIT
D.R.	⏚	DUPLEX RECEPTACLE
S.R.	⏚	SINGLE RECEPTACLE
HP		HORSE POWER
K.W.		KILOWATT
W.		WATT
AMP		AMPERAGE
V.		VOLTAGE
SW		SWITCH
JB.		JUNCTION BOX
		INCANDESCENT LIGHT
		WHITE LED LIGHT
A.F.F.		ABOVE FINISHED FLOOR
D.F.A.		DROP FROM ABOVE
BT		BRANCH & CONNECT TO

ELECTRICAL SYMBOLS LEGEND

	HOME RUN TO PANEL
	CONDUIT RUN UNDERGROUND
	LIGHTING OR POWER PANEL
	DUPLEX RECEPTACLE, GROUNDING TYPE, 20A, 120V
C	DUPLEX RECEPTACLE, GROUNDING TYPE, FLUSH CEILING MOUNTED, 20A, 120V
Q	QUAD RECEPTACLE, GROUNDING TYPE, 20A, 120V
GFCI	DUPLEX RECEPTACLE, GROUND FAULT INTERUPT CAPACITY, MOUNTED 48" AFF 20A, 120V
J	JUNCTION BOX OR PULL BOX – SIZED PER NEC
$	SINGLE POLE TOGGLE(LIGHT) SWITCH 20A, 120V
$2	DOUBLE POLE TOGGLE(LIGHT) SWITCH 20A, 120V
$3	THREE WAY TOGGLE(LIGHT) SWITCH 20A, 120V
▼	ELECTRICAL CONNECTION – CONDUIT
M	THREE PHASE MOTOR
F	FUSED DISCONNECT SWITCH
	NON–FUSED DISCONNECT SWITCH
	TIME SWITCH/CONTACTOR

PROJECT:

Renovation
Car Wash

LOCATION:

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Detroit , Michigan

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ADNAN AL-SAATI

SUBMITTALS

REVISIONS:

PROJECT NO
25-102

DATE
02/05/2025

SCALE
NOTED

SHEET TITLE
Proposed Power Plan
Proposed RISER DIAGRAM

A-12

SEAL

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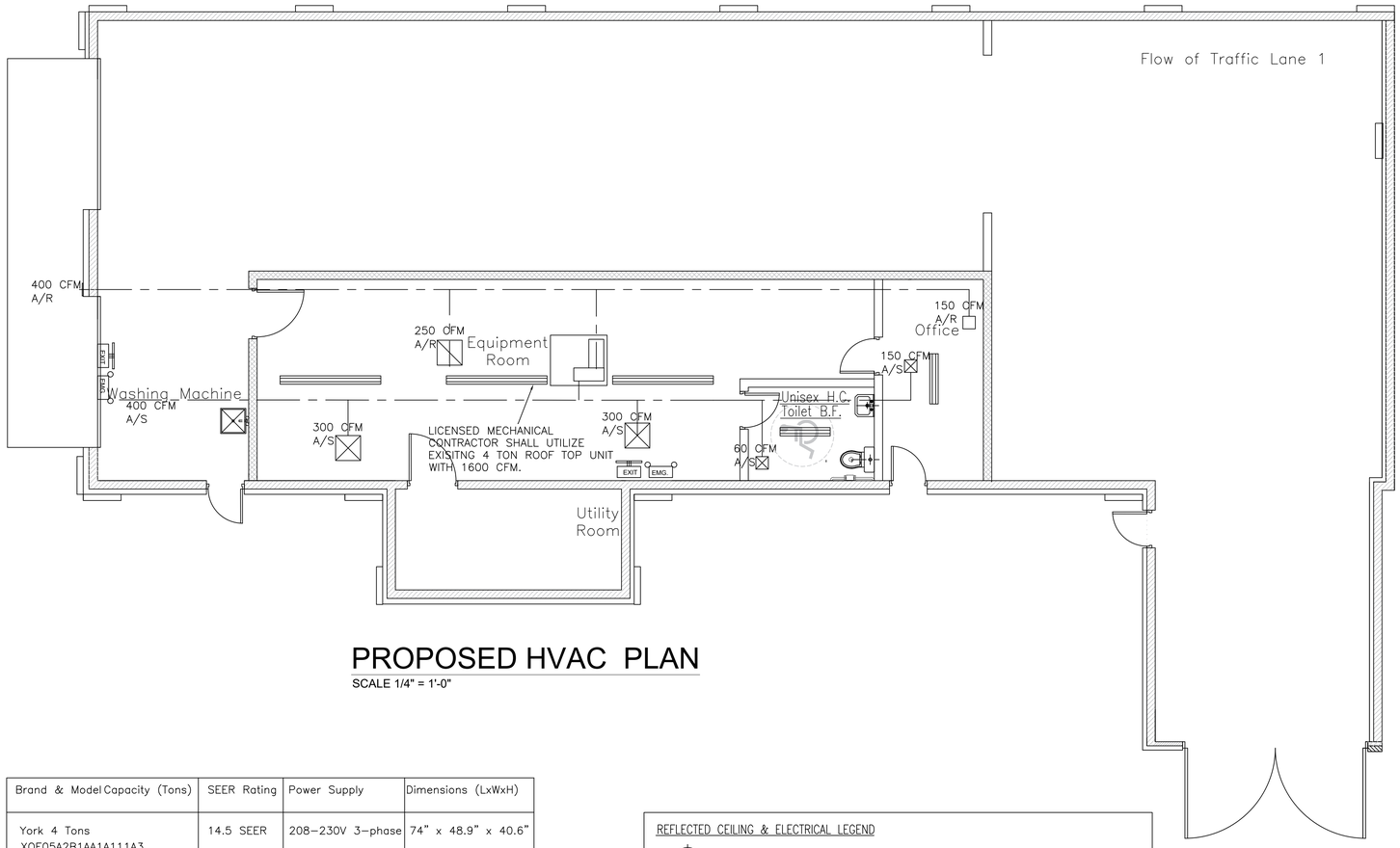

PROPOSED HVAC PLAN

SCALE 1/4" = 1'-0"

Brand & Model	Capacity (Tons)	SEER Rating	Power Supply	Dimensions (LxWxH)
York 4 Tons XQE05A2B1AA1A111A3		14.5 SEER	208–230V 3–phase	74" x 48.9" x 40.6"

–Office space: ~1 ton per 250–300 ft²
Mechanical rooms: Higher load due to heat–generating equipment (~1 ton per 150–200 ft²)

–mixed–use, take an average: 4 tons

–The typical airflow per ton is 400 CFM per ton.
CFM=Tonnage×400

–Mixed–use (4 tons) → 1,600 CFM

REFLECTED CEILING & ELECTRICAL LEGEND

- 150W LED High Bay Light Fixture
- NIGHT LIGHT
- 96"– LED LIGHT FIXTURE T–8, 2–54W ACRYLIC LENS 108W.
- 18"x48" WRAP AROUND FLOURESCENT LIGHT FIXTURE T–8, 4–32W ACRYLIC LENS 142W.
- NIGHT LIGHT FIXTURE
- STANDARD ,WALL MOUNTED EXIT LIGHT FIXTURE W/ BACK–UP BATTERY
- STANDARD,WALL MOUNTED EMERGENCY LIGHT FIXTURE W/ BACK–UP BATTERY
- 24 x 24 AIR SUPPLY DIFUSER
- 24 X 24 RETURN AIR GRILL
- 12 x 12 AIR SUPPLY DIFUSER
- 12 X 12 RETURN AIR GRILL
- 12X6 RETURN AIR GRILL
- 12X6 AIR SUPPLY GRILL
- 100 CFM EXAUST FAN

MECHANICAL NOTES

1. MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE TO INSTALL HEATING SYSTEM COMPONENTS IN ACCORDANCE WITH STATE AND LOCAL CODES AS WELL AS THE NATIONAL FIRE PROTECTION ASSOCIATIONS REGULATIONS. MANUFACTURES INSTRUCTIONS AND RECOMMENDATIONS SHALL ALSO BE FOLLOWED.
2. ALL DUCTS SHALL BE SHEET METAL CONSTRUCTED IN ACCORDANCE WITH "S.M.A.C.N.A." LOW VELOCITY, LOW PRESSURE DUCT MANUAL – LATEST EDITION.
3. DUCTWORK INSTALLATION TO BE COORDINATED WITH ELECTRICAL WORK TO AVOID INTERFERENCE.
4. PROVIDE CANVAS–TYPE VINYL, VIBRATION–ELIMINATION CONNECTION TO EQUIPMENT.
5. THE HVAC SYSTEM SHALL BE COMPLETE WITH ALL NECESSARY APPURTENANCES FOR SATISFACTORY OPERATION. CONTRACTOR SHALL WARRANTEE ALL MATERIALS AND GUARANTEE ALL WORKMANSHIP FOR ONE YEAR FROM SUBSTANTIAL COMPLETION.
6. MECHANICAL CONTRACTOR TO INSTALL ALL LOW VOLTAGE WIRING IN ACCORDANCE WITH ALL STATE AND LOCAL CODES.
7. MECHANICAL CONTRACTOR SHALL PROVIDE AND INSTALL A SMOKE DETECTOR IN THE RETURN AIR OF ROOFTOP HVAC UNIT.
8. ALL BRANCH DUCTS SHALL HAVE BALANCING DAMPER.
9. ALL SUPPLY AIR DIFFUSERS ARE BASED ON "CARNES" MODEL NO. RAPAH, SIZES SHOWN ON DRAWINGS. ALL GRILLES SHALL HAVE INSULATED SOUND BOOT, MINIMUM 36" LONG, OPEN TO PLENUM SPACE.
9. NO FLEX DUCT.
10. ALL SUPLY AIR DIFFUSERS ARE BASED ON "CARNES" MODEL NO. SFTB SIZES SHOWN ON DRAWINGS.
11. FLEXIBLE RUNOUTS TO DIFFUSERS TO BE A MAXIMUM OF 8'–0" IN LENGTH.
12. COORDINATE MECHANICAL EQUIPMENT AND MATERIALS INSTALLATION WITH OTHER BUILDING COMPONENTS. COORDINATE THE INSTALLATION OF MECHANICAL MATERIALS AND EQUIPMENT ABOVE CEILINGS WITH SUSPENSION SYSTEM, LIGHT FIXTURES, AND OTHER INSTALLATIONS.
13. FOR ALL AIR SYSTEMS ADJUST FANS, SUPPLY REGISTER DAMPERS, AND DUCT VOLUME DAMPERS AS NEEDED TO BALANCE ALL DUCTWORK TO MATCH CFM LISTED.
14. ALL DIFFUSERS AND GRILLES SHALL BE FACTORY FINISHED WHITE.
15. ALL MECHANICAL EQUIPMENT SHALL HAVE VIBRATION ISOLATORS, AS WELL AS FLEXIBLE DUCT CONNECTORS.
16. PROVIDE VOLUME DAMPERS AT EACH BRANCH OF A TRUNK DUCT TO A SUPPLY DIFFUSER.
17. MECHANICAL CONTRACTOR SHALL FURNISH RECORD SET OF DRAWINGS WITH ANY DEVIATIONS MARKED IN RED INK.

PROJECT:

Renovation
Car Wash

LOCATION:

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REVISIONS:

PROJECT NO
25-102

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SCALE
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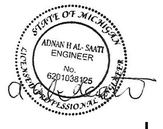
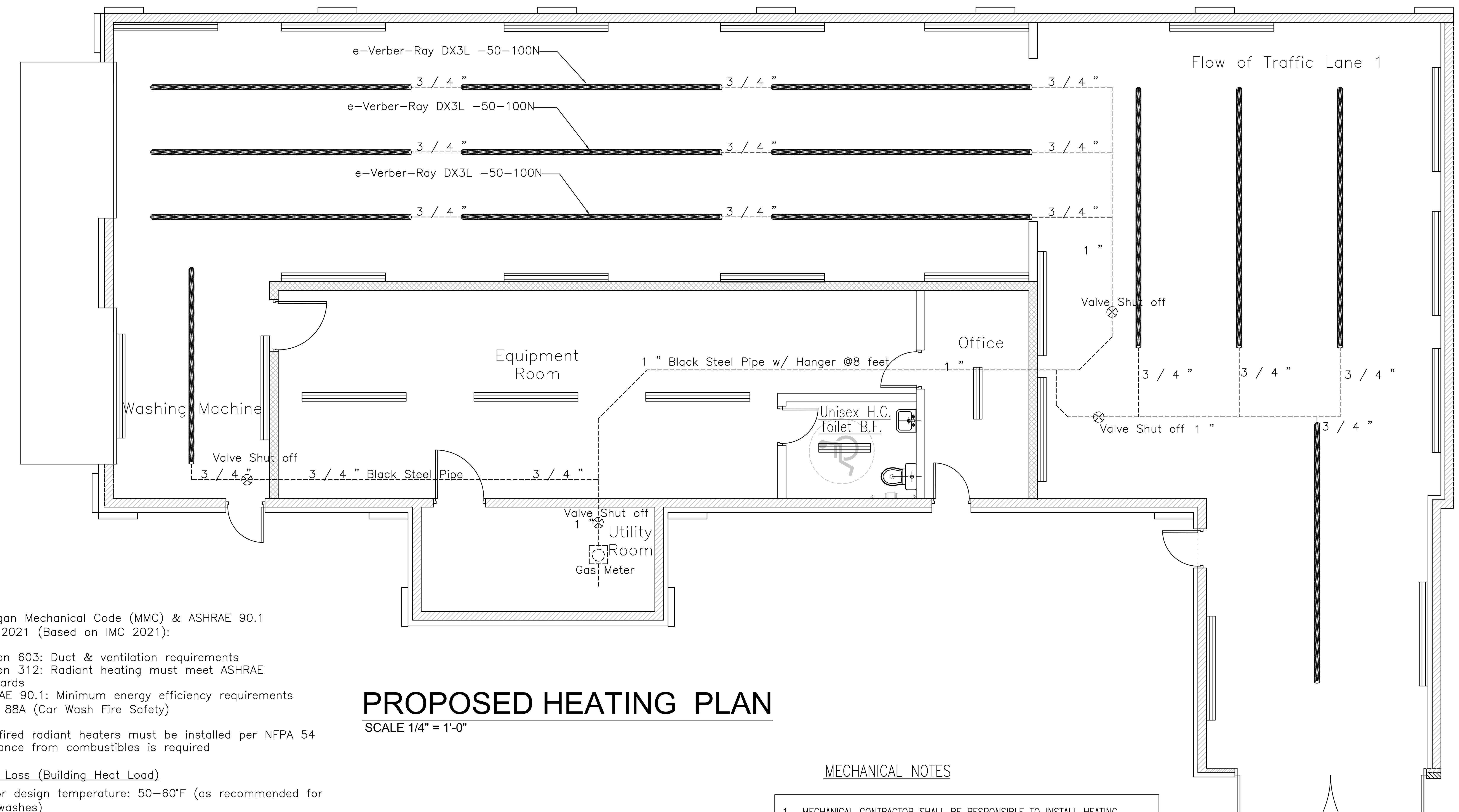
Proposed HVAC Plan

A-13

SEAL





PROPOSED HEATING PLAN

SCALE 1/4" = 1'-0"

Michigan Mechanical Code (MMC) & ASHRAE 90.1
MMC 2021 (Based on IMC 2021):

Section 603: Duct & ventilation requirements
Section 312: Radiant heating must meet ASHRAE standards
ASHRAE 90.1: Minimum energy efficiency requirements
NFPA 88A (Car Wash Fire Safety)

Gas-fired radiant heaters must be installed per NFPA 54
Clearance from combustibles is required

Heat Loss (Building Heat Load)

Indoor design temperature: 50–60°F (as recommended for car washes)
Outdoor design temperature: −10°F to 0°F (for Michigan)
ΔT (Temperature Difference): 60°F to 70°F
Building materials: U-values depend on insulation and wall construction

Q roof=U roof×A roof×ΔT
Heat Loss Through Doors & Openings
Tunnel car washes have large open bay doors, leading to significant infiltration heat loss. ASHRAE provides:

Q infiltration=1.1×CFM×ΔT
CFM (Cubic Feet per Minute) = Air change rate × Building volume
Recommended air change rate: 6–10 ACH (Air Changes per Hour)
Volume Calculation:

V=Area×Height=3,232×16=51,712 ft3

Assuming ACH = 8:

CFM= 8×51,712 /60=6,895 CFM

Q infiltration=1.1×6,895×60=454,030 BTU/hr

Total Heat Loss Estimate
Summing all components:
Q total=Q walls+Q roof+Q doors+Q infiltration

Heating power required
Gas-fired radiant heaters: 30–60 BTU/ft²
Hydronic radiant floors: 20–40 BTU/ft²
Q required =30×3,232=96,960 BTU/hr
Q required =40×3,232=129,280 BTU/hr
Select Infrared Tube Heater Type & Layout

To distribute heat evenly, multiple heaters should be installed along the tunnel. Common configurations:
3 Heaters at 50,000 BTU/hr Each

Spacing:
Position heaters along the centerline or staggered along the sides
Tilt heaters at a slight angle to maximize coverage
Keep at least 3 feet away from car wash equipment

Each Heater consumes approximately 200 watts for the ignition and control systems,
the Total electricity consumption would be:

14Heaters×200watts=2800watts(or 2.8 kW)

MECHANICAL NOTES

1. MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE TO INSTALL HEATING SYSTEM COMPONENTS IN ACCORDANCE WITH STATE AND LOCAL CODES AS WELL AS THE NATIONAL FIRE PROTECTION ASSOCIATIONS REGULATIONS. MANUFACTURES INSTRUCTIONS AND RECOMMENDATIONS SHALL ALSO BE FOLLOWED.

E-Verber-Ray DX3L Series (Detroit Radiant Products)

Model: DX3L-50-100N (50,000 BTU/hr version available)

Fuel Type: Natural Gas or Propane

Tube Length: 20–30 ft (Flexible based on space constraints)

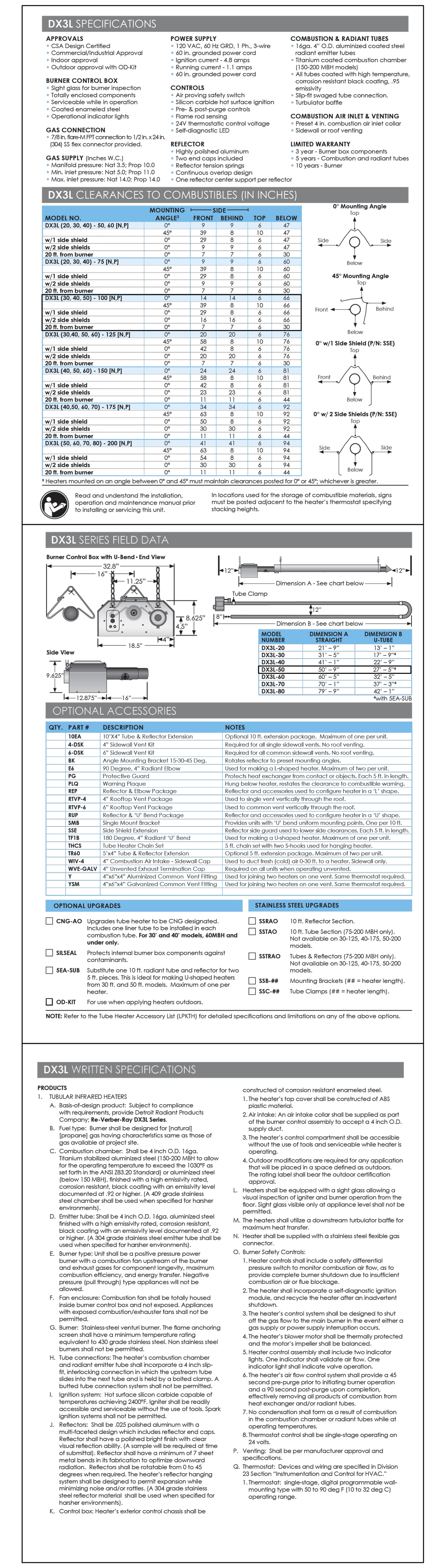
Mounting Height: 12–14 feet (Ideal for your 16-ft high ceiling)

Construction: Aluminized steel tubes with .95 emissive coating

Efficiency: 80–90%

Ignition: Hot surface ignition with pre- and post-purge controls

Durability: Corrosion-resistant, suitable for high-moisture environments



PROJECT:

Renovation Car Wash

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SHEET TITLE
Proposed Heating Plan

A-14

SEAL