#### **GENERAL NOTES:**

- 1. ALL SPRINKLER WORK SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF N.F.P.A.-13. N.F.P.A.-855 AND ALL LOCAL AUTHORITIES.
- 2. ALL SPRINKLER WORK SHALL COMPLY WITH FIRE PROTECTION STANDARDS AND REQUIREMENTS.
- DRAWING INDICATES SPRINKLER SYSTEM DESIGN ONLY. CONTRACTOR RESPONSIBLE FOR OFFSETS, DROPS AND RISES FOR COORDINATION WITH OTHER TRADES.
- 4. ALL PIPING AND ATTACHED APPURTENANCES SUBJECTED TO SYSTEM WORKING PRESSURE SHALL BE HYDROSTATICALLY TESTED AT 200 PSI AND SHALL MAINTAIN THAT PRESSURE WITHOUT LOSS FOR 2 HOURS. PORTIONS OF SYSTEMS NORMALLY SUBJECTED TO SYSTEM WORKING PRESSURES IN EXCESS OF 150 PSI SHALL BE TESTED AT A PRESSURE OF 50 PSI IN EXCESS OF SYSTEM WORKING PRESSURE.
- G.C. SHALL BE RESPONSIBLE FOR ALL FINAL TESTS AND INSPECTIONS OF COMPLETED WORK REQUIRED BY THE PROPERTY MANAGEMENT PRIOR TO OCCUPANCY OF SPACE.
- 6. ALL SPRINKLER WORK SHALL BE TESTED AND MADE OPERATIONAL PRIOR TO FINAL OCCUPANCY. G.C. SHALL REPAIR AND/OR REPLACE ALL FINISHES DAMAGED BY DEFECTIVE SPRINKLER WORK AT HIS EXPENSE.
- 7. ALL BURNING, CUTTING, SOLDERING AND WELDING SHALL BE COORDINATED WITH FIRE SYSTEMS WITH PROPERTY MANAGEMENT, AS REQUIRED.
- 8. G.C. SHALL BE RESPONSIBLE FOR OBTAINING PERMITS AND APPROVALS REQUIRED BY INSPECTOR AND FIRE MARSHALL.
- 9. REFER TO CABINET MANUFACTURER DRAWINGS / DOCUMENTS FOR SPRINKLER HEADS, LIGHT SENSORS AND FIRE DETECTION DEVICES.
- 10. ALL WORK TO BE DONE DURING THE HOURS DESIGNATED BY OWNER/PROPERTY MANAGEMENT.
- 11. G.C. SHALL COORDINATE ARRANGEMENTS FOR TEMPORARY DISCONNECTIONS AND RECONNECTIONS WITH MANAGEMENT PRIOR TO COMMENCEMENT OF
- 12. ALL SERVICE SHUTDOWN SHALL BE BY OWNER / PROPERTY MANAGEMENT MINIMUM OF 48 HOURS NOTICE IS REQUIRED TO THE OWNER / MANAGEMENT OFFICE PRIOR TO SHUT DOWN.
- 13. UPON COMPLETION OF ALL SPRINKLER WORK, CONTRACTOR SHALL TEST AND INSPECT ENTIRE SPRINKLER SYSTEM. ENTIRE SYSTEM SHALL BE FULLY OPERATIONAL AND APPROVED IN COMPLIANCE WITH ALL AHJ.
- 14. UPON SUCCESSFUL COMPLETION OF ALL TESTING, CONTRACTOR SHALL PRIME AND PAINT ALL EXPOSED SPRINKLER PIPING. COLOR AND FINISH SHALL BE AS PER G.C/OWNER.
- 15. CONTRACTOR SHALL COORDINATE WITH OTHER TRADES AND SHALL INSTALL NEW WORK ACCORDINGLY.
- 16. DRAWING INDICATES SPRINKLER SYSTEM DESIGN ONLY. CONTRACTOR RESPONSIBLE FOR OFFSETS, DROPS AND RISES FOR COORDINATION WITH OTHER TRADES.

#### 17. COMPOSITE DRAWINGS

CONTRACTOR SHALL BE GIVEN A SEPIA TRANSPARENCIES TO IMPOSE THEIR WORK FOR A COORDINATED ALLOCATION OF SPACE. PROCEDURE SHALL INCLUDE PIPING, ELECTRICAL, STRUCTURAL AND ARCHITECTURAL DETAILS. SEPIAS SHALL BE GIVEN TO ALL TRADES WHO WILL DRAW HIS WORK ON DRAWINGS. G.C. SHALL HOLD A COORDINATION MEETING WITH ALL CONTRACTORS TO ELIMINATE INTERFERENCE OR CONFLICTS IN INSTALLING WORK, IF UNABLE TO EACH AGREEMENT ISSUE, G.C. SHALL MAKE BINDING DECISION.

#### SPRINKLER LEGEND

NEW SPRINKLER PIPING SPRINKLER SIAMESE CONNECTION SPRINKLER HEAD

#### SPRINKLER DRAWING LIST

APPRX.

SP-001.00 SPRINKLER GENERAL NOTE, SYMBOLS, ABBREVIATIONS AND SPECIFICATIONS.

APPROXIMATE

SP-101.00 SPRINKLER OVERALL PLAN, DETAILED SPRINKLER PLAN & SPRINKLER RISER DIAGRAM.

## DESIGN CRITERIA SUMMARY

HYDRAULIC CALCULATIONS BASED ON THE FOLLOWING:

OCCUPANCY: EXTRA HAZARD 1 MINIMUM DESIGN DENSITY: 0.30 GPM/SQ. FT.

#### SPACING BETWEEN SPRINKLER HEADS

EXTRA HAZARD 1: 10' MAX. COVERAGE PER SPRINKLER HEAD NOTE: MAXIMUM DISTANCE BETWEEN SPRINKLER HEADS & WALLS IS 1/3 THE DISTANCE BETWEEN HEADS.

#### SPRINKLER NOTES

- TYPE OF SYSTEMS SHALL CONFIRM TO THE MASSACHUSETTS BUILDING CODE 2015 CHAPTER 9, MASSACHUSETTS FIRE CODE 2015 CHAPTER 9, MASSACHUSETTS FIRE SPRINKLER CODE 2013 / NFPA 13, 2013 AND NFPA 855.
- 2. ONLY APPROVED MATERIALS SHALL BE USED AS PER NFPA 13 CHAPTER 6 & CHAPTER 10.
- 3. SPRINKLER SHALL BE PROTECTED AGAINST FREEZING AND INJURY AS PER NFPA 13 CHAPTER 7 SECTION 7.6 & CHAPTER 9 SECTION 9.3.
- 4. INSPECTION AND TESTS OF SPRINKLERS SHALL BE CONDUCTED AS PER NFPA-13 ACCORDANCE WITH NFPA-25, CHAPTER 27 SECTION 27.1 AND 27.2.
- 5. THE OCCUPANCY OF THE AREAS TO BE SPRINKLERD IN ACCORDANCE WITH NFPA-13 CHAPTER 5.
- 6. PIPING, FITTINGS, SPECIFICATIONS, PIPE SCHEDULES, SYSTEM TEST PIPES, PROTECTION AGAINST CORROSION, DAMAGE, VALVES, HANGERS, SPRINKLERS GUARDS AND SHIELDS SHALL BE AS PER MASSACHUSETTS BUILDING CODE CHAPTER 9, MASSACHUSETTS FIRE CODE CHAPTER 9 & NPFA 13, 2013.
- 7. STOCK OF SPARE SPRINKLERS WILL BE FURNISHED AS PER NFPA 13, 2013 SECTION 6.2.9.
- 8. SPACING, LOCATION AND POSITION OF SPRINKLER WILL BE AS PER NFPA-13 2013 CHAPTER 8 SECTION 8.5.
- 9. ALL PIPE PASSING THROUGH WALLS WILL COMPLY WITH MASSACHUSETTS BUILDING CODE 2015 SECTION 714.
- 10. DISTANCE OF SPRINKLERS FROM HEAT SOURCE SHALL BE IN AS PER NFPA-13 2013 TABLES 8.3.2.5.
- 11. ALL VALVES SHALL BE IDENTIFIED AS REQUIRED BY NFPA-13 2013 CHAPTER 6 SECTION 6.7.4.
- 12. DRAINAGE SHALL CONFORM TO NFPA-13 2013 SECTION 8.16.2.
- 13. A ONE PIECE REDUCING FITTING OF GOOD DESIGN SHOULD BE USED WHEREVER A CHANGE IS MADE IN THE SIZE OF PIPE, AS PER SECTION 6.4.7 OF NFPA-13 2013.
- 14. DRAIN VALVES AND TEST VALVES SHALL BE APPROVED TYPE AS PER SECTION 6.7.3 OF CHAPTER 6 OF NFPA-13 2013.
- 15. HANGERS SHOULD BE SUPPORTED BY WROUGHT IRON U TYPE OR APPROVED ADJUSTABLE HANGERS. HANGERS SHALL BE OF THE TYPE APPROVED FOR USE WITH THE PIPE OR TUBE INVOLVED, AS PER NFPA-13 2013 CHAPTER 9, SECTION 9.1.
- 16. PROVISIONS SHOULD BE MADE TO FACILITATE FLUSHING SYSTEM PIPING BY PROVIDING FLUSHING CONNECTIONS CONSISTING OF A CAPPED NIPPLE 4" LONG ON END OF A CROSS MAIN AS PER SECTION 8.16.3 OF NFPA-13 2013.
- 17. SPRINKLER SHALL BE AN APPROVED TYPE AS PER SECTION 6.2 OF NFPA-13 2013.
- 18. TEMPERATURE RATING SHALL COMPLY WITH SECTION 8.3.2 OF CHAPTER 8 OF NFPA-13 2013.
- 19. 18" MINIMUM CLEARANCE TO BELOW SPRINKLER DEFLECTOR AS PER CHAPTER 8 SECTION 8.5.6. OF NFPA-13 2013.
- 20. SPACING AND LOCATION OF SPRINKLERS SHALL COMPLY WITH CHAPTER 8 SECTION 8.5 OF NFPA-13 2013.
- 21. PIPE SCHEDULE SYSTEMS SHALL BE IN ACCORDANCE WITH NFPA-13 2013 CHAPTER 23 SECTION 23.5.
- 2013 CHAPTER 23 SECTION 23.3 AND 23.4.
- 23. MINIMUM BRANCH PIPE SIZE TO BE ONE INCH (1").
- 24. THIS APPLICATION IS MADE ONLY FOR WORK INDICATED ON THE SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE

#### SPECIAL INSPECTION SPRINKLER NOTE:

- SPECIAL INSPECTION OF SPRINKLER SYSTEM TO BE PERFORMED IN ACCORDANCE WITH MASSACHUSETTS BUILDING CODE SECTION BC 1704.2 &
- FINAL INSPECTION IN ACCORDANCE WITH MASSACHUSETTS BUILDING CODE 2015 BC 110.3.10 AND AUTHORITY HAVING JURISDICTION.

### HYDRAULIC CALCULATION SUMMARY

HYDRAULIC CALCULATIONS FOR COMMERCIAL AREA BASED ON NFPA 13-2013 SECTION 11.2.3 FOLLOWING

OCCUPANCY: EXTRA HAZARD 1 MINIMUM DESIGN DENSITY: 0.30 GPM/SQ. FT. DESIGN AREA OF APPLICATION: AS PER NFPA 13 HYDRAULICALLY REMOTEST AREA (100 SQ.FT. AREA) NUMBER OF HEADS CALCULATED: K-FACTOR: 5.6

#### PROTECTION AREA OF SPRINKLER HEADS

EXTRA HAZARD 1 : 100 SQ. FT. MAX PER SPRINKLER HEAD

#### SPRINKLER SCHEDULE METAL TEMPERATURE (°F) RESPONSE MODEL# SYMBOL COVERAGE K-FACTOR NPT MFG NAME **APPROVALS** PENDENT STANDARD BRASS 155 STANDARD 5.6 TYC0 TY325 cULus

#### SPRINKLER SPECIFICATIONS

#### 1. THE COMPONENTS INSTALLATION, SIZING, SPACING, CLEARANCES, POSITION AND PART 1 — GENERAL

1.01 REQUIREMENTS

- A. THE SPRINKLER CONTRACTOR SHALL BE A LICENSED, AUTHORIZED INSTALLER OF SPRINKLER SYSTEMS AND SHALL HAVE HAD A MINIMUM OF FIVE YEARS EXPERIENCE IN THE INSTALLATION OF SPRINKLER SYSTEMS IN THE STATE OF MASSACHUSETTS.
- BEFORE SUBMITTING HIS BID, THE SPRINKLER CONTRACTOR SHALL VISIT THE SITE AND SHALL FULLY FAMILIARIZE HIMSELF WITH, AND BECOME FAMILIAR WITH THE DIFFICULTIES THAT WILL ATTEND THE EXECUTION OF THIS WORK. CONTRACTOR SHALL PERFORM THIS PRIOR TO SUBMITTING HIS PROPOSAL. SUBMISSION OF A PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE. AND LATER CLAIMS WILL NOT BE RECOGNIZED FOR EXTRA LABOR. EQUIPMENT OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN HAD SUCH AN EXAMINATION BEEN MADE.
- UPON REVIEW OF THE DRAWINGS AND SPECIFICATIONS, PRIOR TO SUBMITTING HIS PROPOSAL, THE SPRINKLER CONTRACTOR SHALL INFORM TO G.C. OF ANY DISCREPANCIES OR REQUEST CLARIFICATION IN WRITING, IF NECESSARY, CONCERNING THE INTENT OF THE PLANS AND SPECIFICATIONS TO PROVIDE A COMPLETE SPRINKLER SYSTEM INSTALLATION. LATER CLAIMS WILL NOT BE RECOGNIZED FOR EXTRA LABOR, EQUIPMENT OF MATERIALS SHOULD SUCH PROCEDURE NOT BE FOLLOWED.
- THE SCHEDULING OF THE SPRINKLER WORK SHALL BE COORDINATED WITH PROPERTY MANAGEMENT, WITH OTHER CONTRACTORS AND WITH THE ENGINEER.
- NECESSARY SHUT-DOWNS OF BASE BUILDING SPRINKLER SYSTEM MUST BE COORDINATED WITH PROPERTY MANAGEMENT. SHUT-DOWNS OF BASE SYSTEMS SHALL TAKE PLACE AFTER OR BEFORE NORMAL BUSINESS HOURS AND SHALL BE CONSIDERED OVERTIME WORK. THE CONTRACTOR MUST GIVE PROPERTY MANAGEMENT AND FIRE DEPARTMENT 48 HOURS NOTICE PRIOR TO SHUT-DOWN OF SPRINKLER, OR OTHER SYSTEMS.

#### 1.02 WORK INCLUDED

- WORK SHALL INCLUDE ALL SPRINKLER WORK FURNISHED AND INSTALLED AS INDICATED ON THE PLANS AND AS SPECIFIED HEREIN.
- 1. ALL WORK SHALL COMPLY WITH REQUIREMENTS OF THE MASSACHUSETTS BUILDING CODE, NFPA-13, STATE FIRE DEPARTMENT AND OWNERS INSURANCE RATING ORGANIZATION.
- THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL LOCATION OF WORK. SCALED DIMENSIONS SHALL NOT BE USED. ANY DIMENSIONS NOT SHOWN SHALL BE OBTAINED FROM FIELD MEASUREMENTS.

#### 1.03 SHOP DRAWINGS AND SUBMITTALS

- THE SPRINKLER SYSTEM SHALL BE HYDRAULICALLY DESIGNED. CONTRACTOR SHALL SUBMIT CALCULATIONS WITH SHOP DRAWINGS. CALCULATIONS SHALL BE PERFORMED IN ACCORDANCE WITH REQUIREMENTS OF NFPA #13, AND MASSACHUSETTS BUILDING CODE.
- 1.04 BUILDING DEPARTMENT FILING, PERMITS AND CERTIFICATES
- A. THE SPRINKLER CONTRACTOR SHALL FILE ALL REQUIRED DRAWINGS AND HYDRAULIC CALCULATIONS WITH THE BUILDING DEPARTMENT AND BE RESPONSIBLE FOR OBTAINING FINAL APPROVAL.
- ARRANGE FOR INSPECTION AND TESTS OF ANY AND ALL PARTS OF THE WORK AS REQUIRED BY AUTHORITIES HAVING JURISDICTION AND PAY ALL CHARGES FOR SAME.

#### PART 2 - MATERIALS

- A. THE SPRINKLER SYSTEM SHALL BE COMPLETE WITH ALL PIPE, FITTINGS, VALVES, DRAINAGE SYSTEM AND VALVES, HANGERS AND SUPPORTS. ALSO, MISCELLANEOUS WORK ITEMS, SUCH AS, SIGNS AS REQUIRED, VALVE TAGS, ETC., AND ALL OTHER RELATED EQUIPMENT, APPARATUS AND MATERIAL ITEMS NECESSARY FOR COMPLETE, APPROVED TYPE SYSTEM, READY FOR FUTURE EXTENSION.
- 22. HYDRAULICALLY DESIGNED SYSTEMS SHALL BE IN ACCORDANCE WITH NFPA-13 B. ALL PIPE, FITTINGS, HANGERS, SUPPORTS, SPRINKLER HEADS, ETC., SHALL CONFORM TO THE MASSACHUSETTS BUILDING CODE AND NATIONAL FIRE PROTECTION ASSOCIATION'S REQUIREMENTS AS TO TYPES OF MATERIALS, ARRANGEMENT, SIZES AND INSTALLATION. PIPING PENETRATING FIRE RATED PARTITIONS SHALL HAVE OPENING SEALED WITH U.L. APPROVED FIREPROOF SEALANT.

#### 2.02 SPRINKLER PIPING

- ALL SPRINKLER PIPING SHALL BE SCHEDULE 40 IN ACCORDANCE WITH NFPA-13. PIPE SHALL BE UL/FM APPROVED.
- B. STEEL PIPE SHALL BE BETHLEHEM STEEL CO., ALLIED TUBE, BERGER INDUSTRIES OR APPROVED.
- C. PIPE OR TUBE USED IN SPRINKLER SYSTEMS SHALL BE OF THE MATERIALS SPECIFIED IN TABLE 6.3.1.1 OF NFPA 13-2013.
- FITTINGS USED IN SPRINKLER SYSTEMS SHALL BE OF THE MATERIALS LISTED IN TABLE 6.4.1 OF NFPA 13-2013. FITTING SHALL BE UL/FM APPROVED.
- NONMETALLIC PIPES & FITTINGS USED IN MULTIPURPOSE PIPING SYSTEMS NOT EQUIPPED WITH A FIRE DEPARTMENT CONNECTION SHALL BE DESIGNED TO WITHSTAND A WORKING PRESSURE OF NOT LESS THAN 130 PSI AT 120 °F.

#### 2.03 CUTTING AND PATCHING

- 1. DO ALL CUTTING AND CORE DRILLING NECESSARY FOR THE INSTALLATION OF SPRINKLER WORK. ACCURATELY LAYOUT WORK FOR WHICH CUTTING IS REQUIRED. PATCH AND RESTORE ANY DAMAGE WORK TO LIKE NEW CONDITION.
- 2. FOR REPLACEMENT OF THE WORK REMOVED, MATCH EXISTING IN NATURE, CONSTRUCTION AND
- MAINTAIN THE PREMISES FREE FROM ACCUMULATION OF WASTE MATERIAL OR RUBBISH COVERED BY THE WORK, REMOVE ALL SURPLUS MATERIALS, TOOLS ETC. AND LEAVE PREMISES

#### 2.04 FIRE STOPPING

INSTALLATION SHALL BE IN STRICT ACCORDANCE WITH THE MANUFACTURERS PUBLISHED DIRECTIONS AND PER FIRE TESTED DESIGNS THAT HAVE BEEN ACCEPTED BY THE APPROPRIATE CODE AUTHORITY HAVING JURISDICTION.

#### 2.05 PHASING

PHASING SHALL BE COORDINATED BETWEEN THE SPRINKLER CONTRACTOR AND GENERAL CONTRACTOR. SPRINKLER INSTALLATION SHALL BE PHASED IN A MANNER WHICH WILL ALLOW FULL OCCUPANCY OF THE EXISTING FACILITY WHILE THE INSTALLATION IS IN PROGRESS.

#### 2.06 ALTERNATES/SUBSTITUTIONS

CONTRACTOR SHALL STATE IN THEIR PROPOSAL ANY CONTRACTOR PROPOSED SUBSTITUTIONS OF THE MATERIALS OR METHODS OF INSTALLATION FROM THAT SPECIFIED. THESE ALTERATIONS SHALL BE LISTED ON THE PROPOSAL AS CONTRACTOR ALTERNATIVE.

#### 2.07 LEAK DAMAGE

THE SPRINKLER CONTRACTOR SHALL BE RESPONSIBLE DURING THE INSTALLATION AND TESTING PERIODS OF THE SPRINKLER SYSTEM FOR ANY LOSS OR DAMAGE TO THE WORK OF OTHERS, TO THE PROPERTY, IT'S CONTENTS ETC. CAUSED BY LEAKS IN THE EQUIPMENT. BY UNPLUGGED OR DISCONNECTED PIPES, FITTINGS ETC. OR BY OVERFLOW, AND SHALL PAY FOR THE NECESSARY REPLACEMENTS OR REPAIRS TO THE WORK OF OTHERS, DAMAGED BY SUCH LEAKAGE.

2.08 INSERTS, HANGERS, ETC.

- F. ALL SPRINKLER PIPING SHALL BE SUBSTANTIALLY SUPPORTED AND SHALL COMPLY WITH THE STANDARDS FOR THE NATIONAL FIRE PROTECTION ASSOCIATION FOR THE INSTALLATION OF SPRINKLER SYSTEMS AND AS REQUIRED BY THE MASSACHUSETTS BUILDING CODE.
- G. HANGERS AND THEIR COMPONENTS SHALL BE FERROUS. HANGERS SHALL BE ADJUSTABLE FLAT IRON TYPE OF CLEVIS TYPE.
- H. SPRINKLER PIPING OR HANGERS SHALL NOT BE USED TO SUPPORT NON-SYSTEM COMPONENTS.
- SPRINKLER PIPING SHALL BE SUBSTANTIALLY SUPPORTED FROM THE CABINET STRUCTURE WHICH MUST SUPPORT THE ADDED LOAD OF THE WATER-FILLED PIPE PLUS A MINIMUM OF 250 LBS. APPLIED AT THE POINT OF HANGING. CONTRACTOR SHALL SUBMIT DETAIL OF SUPPORT FOR REVIEW
- SPRINKLER PIPING SHALL BE SUPPORTED INDEPENDENTLY OF THE CABINET STRUCTURE. ALTERNATIVELY ADD ADDITIONAL SUPPORT IF REQUIRED.
- MAXIMUM DISTANCE BETWEEN PIPE SUPPORTS SHALL NOT EXCEED 12 FT. FOR 1 AND 1-1/4" SIZES NOR 15' FOR SIZES 1-1/2" AND LARGER.
- EXPANSION SHIELDS FOR SUPPORTING PIPES UNDER CONCRETE CONSTRUCTION MAYBE USED IN A HORIZONTAL POSITION IN THE SIDES OF BEAMS. IN CONCRETE HAVING GRAVEL OR CRUSHED STONE AGGREGATE, EXPANSION SHIELDS MAY BE USED IN THE VERTICAL POSITION TO SUPPORT PIPES 4" OR LESS IN DIAMETER.

#### 2.09 ESCUTCHEONS

PROVIDE ESCUTCHEONS ON ALL EXPOSED PIPING PASSING THROUGH WALLS, PARTITIONS, FLOORS. ESCUTCHEON SHALL BE HELD IN PLACE BY INTERNAL TENSION OR SET SCREW.

#### 2.10 AS-BUILT DRAWINGS

PREPARE AND SUBMIT "AS BUILT" DRAWINGS AT THE COMPLETION OF THE PROJECT.

#### 2.11 SPRINKLER HEADS

- A. SPRINKLERS SHALL BE RATED FOR ORDINARY TEMPERATURES (155 DEG. F) EXCEPT AS REQUIRED NEAR HEATERS OR LOCATIONS WHERE ELEVATED TEMPERATURES MAY NORMALLY BE EXPECTED OR AS OTHERWISE INDICATED ON THE CONTRACT DRAWINGS.
- B. SPRINKLER HEADS SHALL BE AS PER CABINET MANUFACTURER OR UL AND FM APPROVED.

#### PART 3 – EXECUTION

#### 3.01 GUARANTEE

A. GUARANTEE FOR A PERIOD OF ONE (1) YEAR FORM THE DATE OF ACCEPTANCE BY THE OWNER, ALL MATERIALS, APPARATUS AND WORKMANSHIP WHETHER FURNISHED BY HIMSELF OR BY HIS SUBCONTRACTORS AND HE SHALL REPLACE OR REPAIR IN A MANNER APPROVED BY THE PROPERTY MANAGEMENT, WITHOUT COST TO THE OWNER, ANY PART OR PARTS OF THE WORK WHICH MAY PROVE DEFECTIVE OR UNSATISFACTORY WITH IN THE PERIOD OF THE GUARANTEE.

#### 3.02 INSTALLATION

- 1. INSTALL PIPING AS SHOWN ON THE CONTRACT DRAWINGS AND STRAIGHT AND DIRECT AS POSSIBLE, FORMING RIGHT ANGLES OR PARALLEL LINES WITH WALLS, NEATLY SPACED, WITH RISERS PLUMB AND TRUE.
- 2. SPRINKLER PIPING SHALL BE INSTALLED SO THAT THE SYSTEM CAN BE DRAINED.
- 3. PIPE SHALL BE REMOVED BY REAMING.

TAPE, APPLIED ON THE MALE THREADS ONLY.

4. BEFORE INSTALLING PIPE, THOROUGHLY CLEAN THE INSIDE FREE OF CUTTING AND FOREIGN MATTER. CUT ALL PIPE SQUARE AND SMOOTH AND MAKE UP ALL JOINTS TO REQUIRED LIMITS.

1. THREADED JOINTS SHALL BE MADE UP OF TIGHT USING PIPE JOINT TEFLON COMPOUND OR

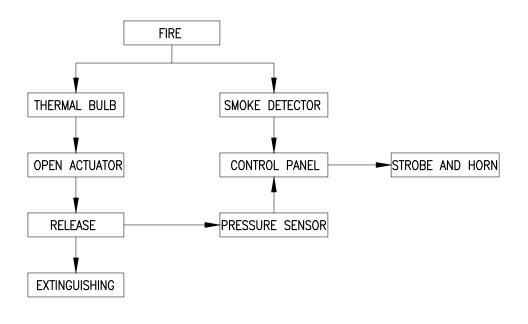
# FIRE DEPARTMENT-SPRINKLER CONNECTION 2½"x2½"x4", 36" AFF.

**KEY PLAN** 

#### FIRE NARRATIVE

DURING A FIRE EVENT, CONNECT THE WATER HOSE TO AN EXTERNAL FIRE DEPARTMENT CONNECTION PROVIDED BY THE END USER. WATER WILL IMMEDIATELY FLOW INTO THE ENTIRE DRY PIPE SYSTEM. ONLY OVERHEATED CABINET NOZZLE WITH TEMPERATURE BULB SHALL BE ACTIVATED AND SPRAYING WATER TO EXTINGUISH FIRE; (THE OUTDOOR WATER PIPE, SOURCE AND CONTROL SYSTEM SHOULD BE DONE BY OTHERS). WATER WILL CONTINUE TO FLOW THROUGH THE OPEN NOZZLE HEAD UNTIL

THE ENTIRE CABINET IS FLOODED.



FIRE DETECTION AND EXTINGUISH GENERAL FLOW DIAGRAM

NO. DATE ISSUE DESCRIPTION

## **NEARBY ENGINEERS**

382 NE 191ST STREET SUITE 49674, MIAMI, FL 33179 PH-914.257.3455 WWW.NY-ENGINEERS.COM

ROJECT NAME

HYSICAL LOCATION

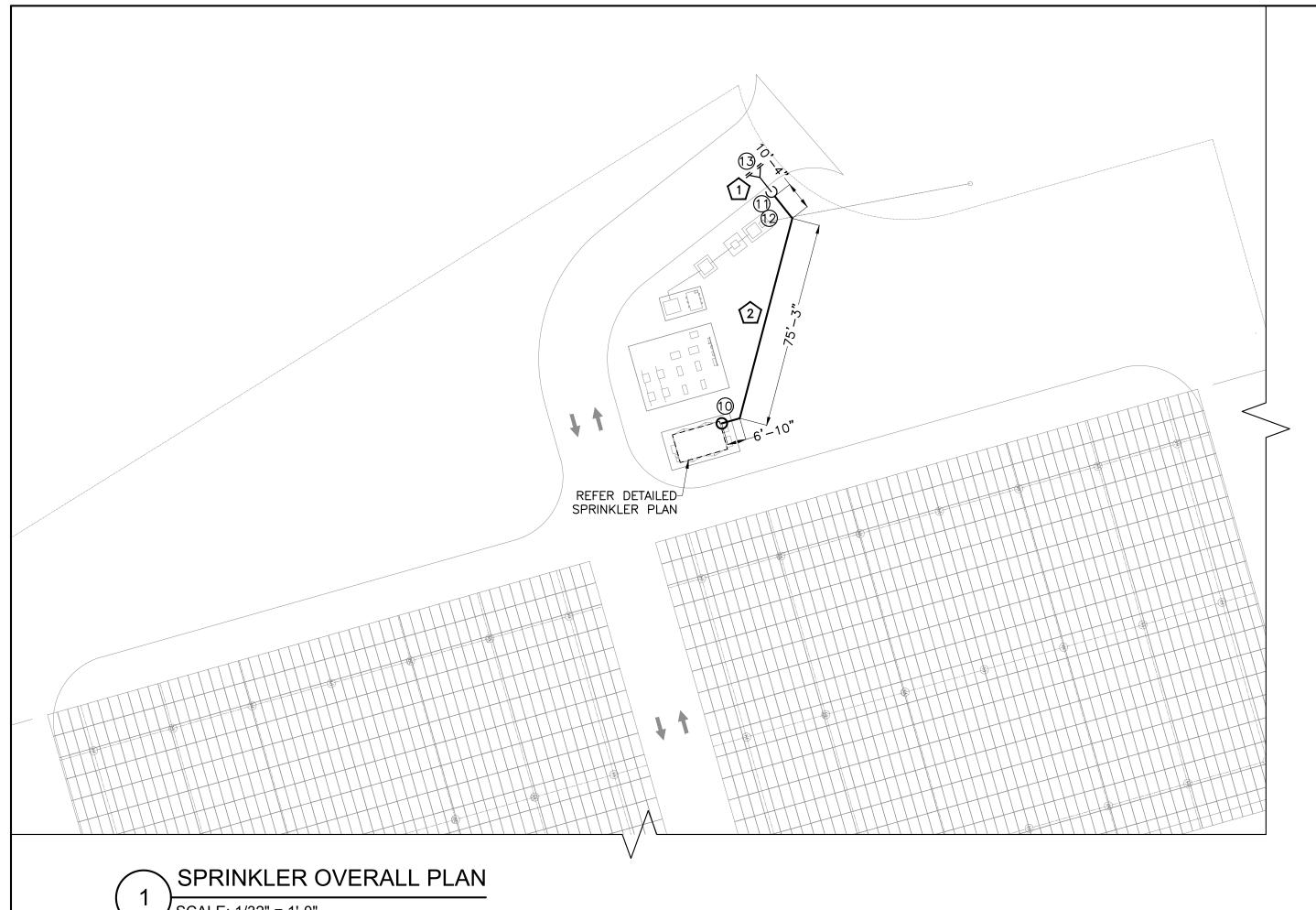
SPRINKLER GENERAL NOTES, SYMBOLS, **ABBREVIATIONS AND SPECIFICATIONS** 

GRAPHIC SCALE

PROJECT NO. AS NOTED NYE NYE 01/19/2024

SP-001.00

ET NUMBER



DESIGN AS PER NFPA 13 FOR EXTRA

ON DRY PIPE SPRINKLER CONSISTING

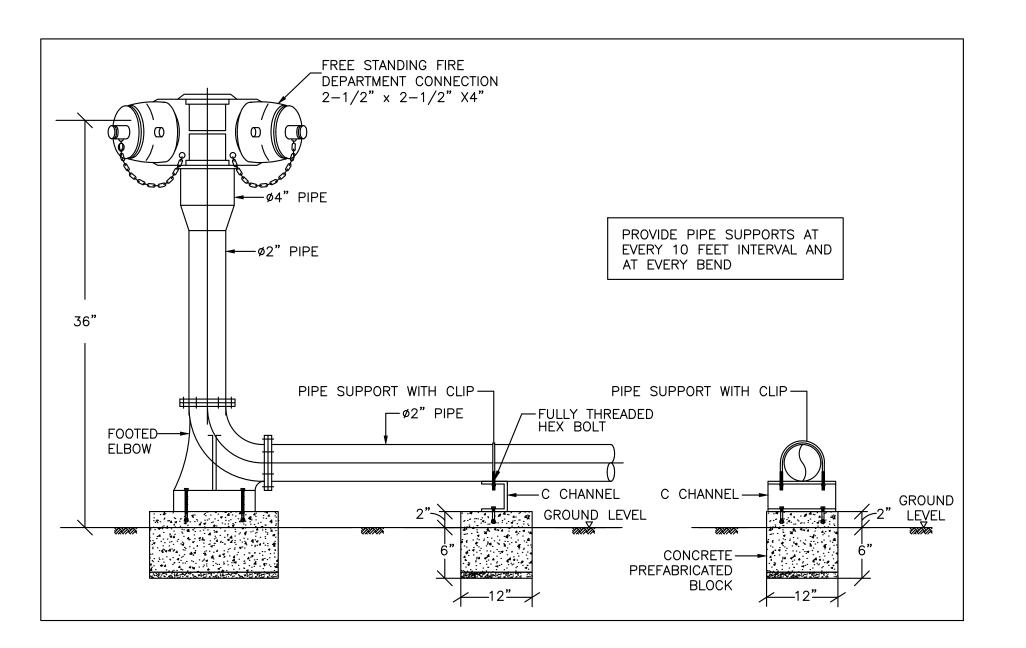
OF MOST REMOTE FOUR (4)

HYDRAULICALLY MOST DEMANDING

STANDARD RESPONSE SPRINKLERS.

DESIGN DENSITY = 0.3 GPM/SQ.FT.

HAZARD-1 OCCUPANCY. DESIGN BASED



FIRE DEPARTMENT CONNECTION DETAIL

1" TO SPRINKLER HEAD <sup>72</sup> → TO SPRINKLER HEAD <sup>2</sup> <del>-</del> TO SPRINKLER HEAD <sup>2</sup> <del>-</del> TO SPRINKLER HEAD FREE STANDING SPRINKLER SIAMESE CONNECTION SPRINKLER SYSTEM DEMAND 2½"X2½"X4" 60.59 GPM FLOW AT 17 PSI PRESSURE (AS PER HYDRAULIC CALCULATION) VALVE AND END PLUG. -APPRX. 92 FEET-COORDINATE LOCATION W/ GENERAL CONTRACTOR/OWNER. GROUND LEVEL -PIPE SUPPORTS (TYP.)

\_1" DRAIN PIPE W/ MANUAL DRAIN CONTROL

SPRINKLER RISER DIAGRAM

HAZARD CLASSIFICATION AND DESIGN DENSITY: AREA: BATTERY CABINET

OCCUPANCY: EXTRA HAZARDS-1 MINIMUM DESIGN DENSITY: 0.30 GPM/SQ. FT.

#### SPRINKLER LEGEND:

- FIRE DEPARTMENT SPRINKLER CONNECTION 2½"x2½"x4", 36" AFF.

  MAINTAIN MINIMUM 10' EXPOSURE CLEARANCE BETWEEN FIRE DEPARTMENT CONNECTION & THE BESS CABINET BODY. MAINTAIN MINIMUM 3' CONNECTION CLEARANCE ON FRONT SIDE OF FIRE DEPARTMENT CONNECTION. (PROVIDE SOLID BRONZE MATERIAL FOR FIRE DEPARTMENT CONNECTION). REFER KEY PLAN ON SHEET SP-001 FOR EXACT LOCATION.
- NEW 2" DRY SPRINKLER PIPE RUNNING ABOVE GROUND. COORDINATE PIPING LAYOUT W/ SOLAR CONSULTANT & OTHER
- COORDINATE SPRINKLER LOCATION & PIPING W/ EQUIPMENT CONTRACTOR.
- COORDINATE WITH CABINET MANUFACTURER AND GC FOR SPRINKLER PIPING SUPPORT FROM THE CABINET. PROVIDE ADD ALTERNATE FOR ANY ADDITIONAL PIPING SUPPORTS IF REQUIRED.
- SPRINKLER PIPING AND SPRINKLER HEAD BY CABINET MANUFACTURER. COORDINATE PIPING CONNECTION WITH CABINET MANUFACTURER.
- 1" DRAIN PIPE W/ MANUAL DRAIN CONTROL VALVE INSTALL VERTICALLY (SEE SPRINKLER RISER DIAGRAM FOR DETAILS). COORDINATE LOCATION W/ GENERAL CONTRACTOR/OWNER.

NO. DATE ISSUE DESCRIPTION

**NEARBY ENGINEERS** 

382 NE 191ST STREET SUITE 49674, MIAMI, FL 33179 PH-914.257.3455 WWW.NY-ENGINEERS.COM

ROJECT NAME

HYSICAL LOCATION

SPRINKLER OVERALL PLAN, DETAILED SPRINKLER PLAN & SPRINKLER RISER DIAGRAM

GRAPHIC SCALE

PROJECT NO. AS NOTED NYE NYE

SP-101.00

EET NUMBER

01/19/2024

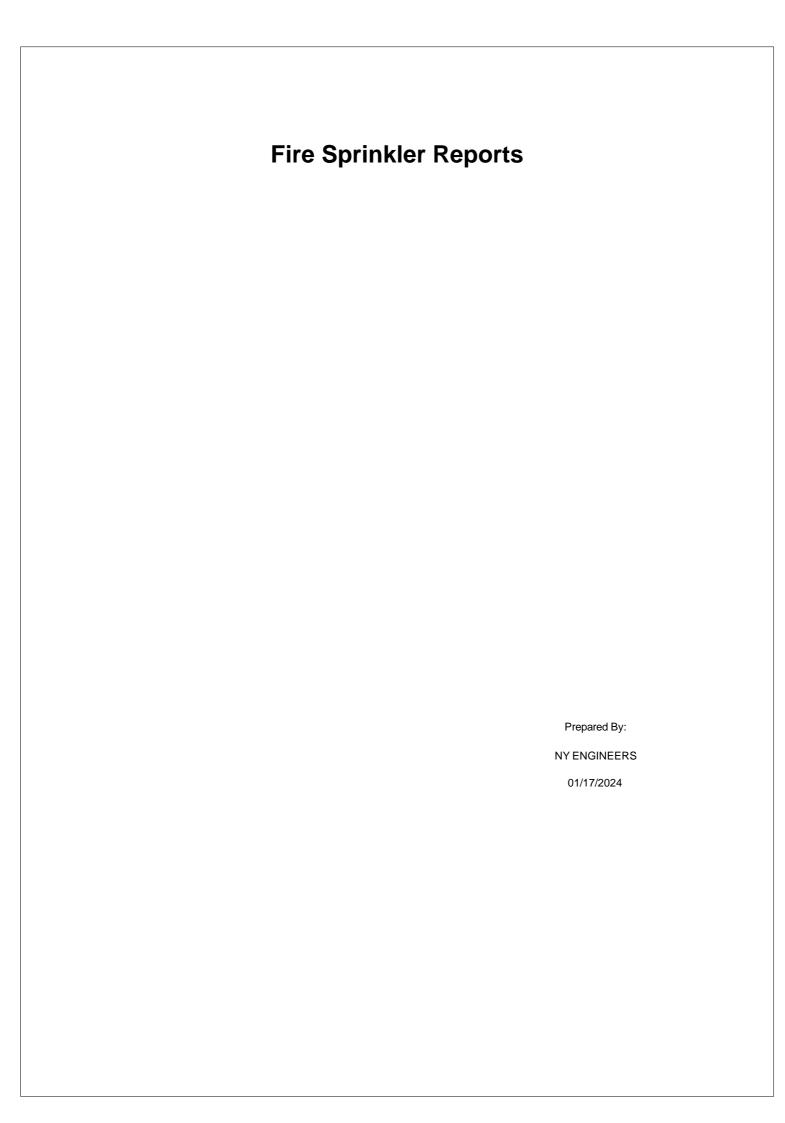
DETAILED SPRINKLER PLAN SCALE: 1/4" = 1'-0"

PENDENT SPRINKLER

HEADS (TYP.)

2" DRY -SPRINKLER

PIPE DROP



#### **General Project Data Report**

#### **General Data**

Project Title: Project File Name:

Designed By: Date:

Code Reference: Approving Agency:

Client Name: Phone:

Address: City, State Zip Code: Representative: Company Address: City And State:

Phone:

Building Name:

Contact at Building:

Address Of Building:

Building Owner:

Phone at Building:

City, State Zip Code:

#### **Project Data**

**Description Of Hazard:** Ex. Haz. Gp. 1 Sprinkler System Type: Dry Design Area Of Water Application: 100 ft<sup>2</sup> Maximum Area Per Sprinkler: 50 ft<sup>2</sup> 5.60 K Default Sprinkler K-Factor: Default Pipe Material: SCHED 40 WET STEEL Inside Hose Stream Allowance: 0.00 gpm Outside Hose Stream Allowance: 0.00 gpm

In Rack Sprinkler Allowance: 0.00 gpm

Sprinkler Specifications

Make: TYCO Model: TY325
Size: 0.50 Temperature Rating: 155 F

#### **Water Supply Test Data**

Source Of Information:

Test Hydrant ID: Date Of Test:

Hydrant Elevation:0 ftStatic Pressure:0.00 psiTest Flow Rate:0.00 gpmTest Residual Pressure:0.00 psiCalculated System Flow Rate:60.59 gpmCalculated Inflow Residual Pressure:17.19 psi

#### **Calculation Project Data**

Calculation Mode: Demand

HMD Minimum Residual Pressure: 7.00 psi Minimum Desired Flow Density: 0.30 gpm/ft²

Number Of Active Nodes: 17

Number Of Active Pipes:16Number Of Inactive Pipes:0Number Of Active Sprinklers:4Number Of Inactive Sprinklers:0

#### **Node Input Data**

Node No.	Node Description Branch Description	Area Group Branch Dia. (in)	Sprinkler KFactor (K) Branch Len. (ft)	Pressure Estimate (psi) Branch Stnd Fittings	Node Elev (ft) Branch Non- Stnd Fittings (ft)	Non-Sprinkler Flow (gpm) Branch Sprk KFactor (K)
1	No Discharge	0.000	N/A 0.0	9.41	8.00 0.0	0.00 0.00
2	No Discharge	0.000	N/A 0.0	9.54	8.00 0.0	0.00 0.00
3	No Discharge	0.000	N/A 0.0	9.08	8.00 0.0	0.00 0.00
4	No Discharge	0.000	N/A 0.0	9.21	8.00 0.0	0.00 0.00
5	No Discharge	0.000	N/A 0.0	8.93	8.00 0.0	0.00 0.00
6	No Discharge	0.000	N/A 0.0	9.06	8.00 0.0	0.00 0.00
7	No Discharge	0.000	N/A 0.0	8.88	8.00 0.0	0.00 0.00
8	No Discharge	0.000	N/A 0.0	9.01	8.00 0.0	0.00 0.00
9	No Discharge	0.000	N/A 0.0	10.25	8.00	0.00
10	No Discharge	0.000	N/A 0.0	13.76	1.00	0.00
11	No Discharge	0.000	N/A 0.0	17.37	1.00	0.00
12	No Discharge	0.000	N/A 0.0	16.98	2.50	0.00
13	No Discharge	0.000	N/A 0.0	17.19	2.50 0.0	0.00
101	Sprinkler 	0.000	5.60 0.0	7.58	7.00 0.0	0.00
102	Sprinkler 	0.000	5.60 0.0	7.33	7.00	0.00
103	Sprinkler 	0.000	5.60 0.0	7.21	7.00	0.00
104	Sprinkler 	0.000	5.60	7.17	7.00 0.0	0.00

#### **Pipe Input Data**

	End		Nominal	Turno	Fitting	Nominal	Fitting	Total	CFactor
Beg. Node	End. Node	Pipe Description	Diameter (inch)	Type Group	Data	Length (feet)	Length (feet)	Length (feet)	(gpm/inc h-psi)
104	7	SCHED 40 WET STEEL	0.500	0	Е	1.20	1.00	2.20	120
7	8	SCHED 40 WET STEEL	1.000	0		1.70	0.00	1.70	120
8	6	SCHED 40 WET STEEL	2.000	0	Т	5.30	10.00	15.30	120
103	5	SCHED 40 WET STEEL	0.500	0	Е	1.20	1.00	2.20	120
5	6	SCHED 40 WET STEEL	1.000	0		1.70	0.00	1.70	120
6	4	SCHED 40 WET STEEL	2.000	0	Т	5.30	10.00	15.30	120
102	3	SCHED 40 WET STEEL	0.500	0	Е	1.20	1.00	2.20	120
3	4	SCHED 40 WET STEEL	1.000	0		1.70	0.00	1.70	120
4	2	SCHED 40 WET STEEL	2.000	0	Т	5.30	10.00	15.30	120
101	1	SCHED 40 WET STEEL	0.500	0	Е	1.20	1.00	2.20	120
1	2	SCHED 40 WET STEEL	1.000	0		1.70	0.00	1.70	120
2	9	SCHED 40 WET STEEL	2.000	0	Т	8.90	10.00	18.90	120
9	10	SCHED 40 WET STEEL	2.000	0	Е	8.00	5.00	13.00	120
10	11	SCHED 40 WET STEEL	2.000	0	Е	92.00	5.00	97.00	120
_11	12	SCHED 40 WET STEEL	2.000	0	Е	2.00	5.00	7.00	120
12	13	SCHED 40 WET STEEL	2.000	0	Е	0.50	5.00	5.50	120

#### **Overall Node Groupings Output Data**

Dia - 0-		D:	Disco	On similation Electric	Name Oranial	des Elecci	Dan Mada	lands at a second
Pipe Se		Pipe	Pipe	Sprinkler Flow	Non-Sprink		Beg. Node	Imbalance
Beg.	End.	Type	Flow Rate	At Beg. Node	Out (+)	In (-)	Residual	Flow At Beg.
Node	Node	Group	(gpm)	(gpm)	(gpm)	(gpm)	Pressure (psi)	Node (gpm)
1	101	0	15.41	0.00	0.00	0.00	9.41	0.00002
1	2	0	-15.41					
2	1	0	15.41	0.00	0.00	0.00	9.54	0.00000
2	4	0	45.18					
2	9	0	-60.59					
3	102	0	15.15	0.00	0.00	0.00	9.08	0.00000
3	4	0	-15.15					
	•		10110					
4	2	0	-45.18	0.00	0.00	0.00	9.21	0.00000
4	3	0	15.15	0.00	0.00	0.00	0.21	0.0000
4	6	0	30.03					
	0	0	30.03					
_	103	0	15.02	0.00	0.00	0.00	8.93	0.00000
5		0	15.03	0.00	0.00	0.00	0.93	0.00000
5	6	0	-15.03					
		0	00.00	0.00	0.00	0.00	0.00	0.00004
6	4	0	-30.03	0.00	0.00	0.00	9.06	-0.00001
6	5	0	15.03					
6	8	0	15.00					
7	104	0	14.99	0.00	0.00	0.00	8.88	-0.00648
7	8	0	-15.00					
8	6	0	-15.00	0.00	0.00	0.00	9.01	0.00000
8	7	0	15.00					
9	2	0	60.59	0.00	0.00	0.00	10.25	0.00000
9	10	0	-60.59					
10	9	0	60.59	0.00	0.00	0.00	13.76	0.00000
10	11	0	-60.59					
11	10	0	60.59	0.00	0.00	0.00	17.37	0.00000
11	12	0	-60.59	0.00	0.00	0.00	17.07	0.0000
	- 12		00.00					
12	11	0	60.59	0.00	0.00	0.00	16.98	0.00000
12	13	0	-60.59	0.00	0.00	0.00	10.30	0.0000
1	13	U	-60.59					
40	40	0	00.50	0.00	0.00	CO FO	47.40	
13	12	0	60.59	0.00	0.00	-60.59	17.19	
404	4	0	45.44	45.40	0.00	0.00	7.50	0.00770
101	1	0	-15.41	15.42	0.00	0.00	7.58	0.00779
400	•	^	45.45	45.40	0.00	0.00	7.00	0.00700
102	3	0	-15.15	15.16	0.00	0.00	7.33	0.00732
400	_	^	45.00	45.00	0.00	0.00	7.04	0.0074.4
103	5	0	-15.03	15.03	0.00	0.00	7.21	0.00714
	_	_						
104	7	0	-14.99	15.00	0.00	0.00	7.17	0.00808

#### **Overall Pipe Output Data**

Beg.	Nodal	Floretter	Spk/Hose	Residual	Nom. Dia.	q (gpm)	F. L./ft	Pipe-Len.	PF-(psi)		
End.	<b>KFactor</b>	Elevation	Discharge	Pressure	Inside Dia.	Q (gpm)	(psi/ft)	Fit-Len.	PE-(psi)		
Node	(K)	(feet)	(gpm)	(psi)	C-Value	Velocity	Fittings	Tot-Len.	PT-(psi)		
			, , ,			(fps)	Type-Grp	(ft)			
101	5.60	7.00	15.42	7.58	0.50	15.42	1.02497	1.20	2.255		
1	0.00	8.00	0.00	9.41	0.622	15.41	Е	1.00	-0.433		
		0 40 WET S		_	120	16.28	0	2.20	1.822		
1	0.00	8.00	0.00	9.41	1.00	0.00	0.08041	1.70	0.137		
2	0.00	8.00	0.00	9.54	1.049	15.41		0.00	0.000		
	SCHE	O 40 WET S	STEEL		120	5.72	0	1.70	0.137		
	0.00	0.00	0.00	0.04	0.00	0.00	0.00400	5.00	0.004		
4	0.00	8.00	0.00	9.21	2.00	0.00	0.02162	5.30	0.331		
2	0.00	8.00	0.00	9.54	2.067	45.18	T	10.00	0.000		
	SCHEI	O 40 WET S	DIEEL		120	4.32	0	15.30	0.331		
102	5.60	7.00	15.16	7.33	0.50	15.16	0.99296	1.20	2.185		
3	0.00	8.00	0.00	9.08	0.622	15.15	E	1.00	-0.433		
		O 40 WET S		0.00	120	16.00	0	2.20	1.752		
	001121		,,		.20	10.00		2.20			
3	0.00	8.00	0.00	9.08	1.00	0.00	0.07790	1.70	0.132		
4	0.00	8.00	0.00	9.21	1.049	15.15		0.00	0.000		
	SCHE	0 40 WET S			120	5.62	0	1.70	0.132		
6	0.00	8.00	0.00	9.06	2.00	0.00	0.01015	5.30	0.155		
4	0.00	8.00	0.00	9.21	2.067	30.03	Т	10.00	0.000		
	SCHE	O 40 WET S	STEEL		120	2.87	0	15.30	0.155		
400	F 00	7.00	45.00	7.04	0.50	45.00	0.07700	4.00	0.454		
103	5.60	7.00	15.03	7.21	0.50	15.03	0.97790	1.20	2.151		
5	0.00	8.00	0.00	8.93	0.622	15.03	E	1.00	-0.433		
	SCHEI	O 40 WET S	DIEEL		120	15.87	0	2.20	1.718		
5	0.00	8.00	0.00	8.93	1.00	0.00	0.07671	1.70	0.130		
6	0.00	8.00	0.00	9.06	1.049	15.03	0.07071	0.00	0.000		
		O 40 WET S		0.00	120	5.58	0	1.70	0.130		
						0.00					
8	0.00	8.00	0.00	9.01	2.00	0.00	0.00281	5.30	0.043		
6	0.00	8.00	0.00	9.06	2.067	15.00	Т	10.00	0.000		
	SCHE	O 40 WET S	STEEL		120	1.43	0	15.30	0.043		
104	5.60	7.00	15.00	7.17	0.50	15.00	0.97363	1.20	2.142		
7	0.00	8.00	0.00	8.88	0.622	14.99	Е	1.00	-0.433		
	SCHE	O 40 WET S	STEEL		120	15.83	0	2.20	1.709		
_	0.00	0.00	0.00	0.00	4.00	0.00	0.07044	4.70	0.400		
7	0.00	8.00	0.00	8.88	1.00	0.00	0.07644	1.70	0.130		
8	0.00	8.00	0.00	9.01	1.049	15.00		0.00	0.000		
	SCHEI	D 40 WET S	DIEEL		120	5.57	0	1.70	0.130		
2	0.00	8.00	0.00	9.54	2.00	0.00	0.03721	8.90	0.703		
9	0.00	8.00	0.00	10.25	2.067	60.59	0.03721 T	10.00	0.000		
		O.00 O 40 WET S		10.20	120	5.79	0	18.90	0.703		
	30					55					
9	0.00	8.00	0.00	10.25	2.00	0.00	0.03721	8.00	0.484		
10	0.00	1.00	0.00	13.76	2.067	60.59	E	5.00	3.031		
	SCHE	O 40 WET S	STEEL		120	5.79	0	13.00	3.515		

#### **Overall Pipe Output Data (cont'd)**

Beg. End. Node	Nodal KFactor (K)	Elevation (feet)	Spk/Hose Discharge (gpm)	Residual Pressure (psi)	Nom. Dia. Inside Dia. C-Value	q (gpm) Q (gpm) Velocity (fps)	F. L./ft (psi/ft) Fittings Type-Grp	Pipe-Len. Fit-Len. Tot-Len. (ft)	PF-(psi) PE-(psi) PT-(psi)
10	0.00	1.00	0.00	13.76	2.00	0.00	0.03721	92.00	3.609
11	0.00	1.00	0.00	17.37	2.067	60.59	Е	5.00	0.000
	SCHE	D 40 WET S	STEEL		120	5.79	0	97.00	3.609
11	0.00	1.00	0.00	17.37	2.00	0.00	0.03721	2.00	0.260
12	0.00	2.50	0.00	16.98	2.067	60.59	E	5.00	-0.650
	SCHE	D 40 WET S	STEEL		120	5.79	0	7.00	-0.389
12	0.00	2.50	0.00	16.98	2.00	0.00	0.03721	0.50	0.205
13	0.00	2.50	0.00	17.19	2.067	60.59	Е	5.00	0.000
	SCHE	D 40 WET S	STEEL		120	5.79	0	5.50	0.205

#### **Overall Sprinkler Output Data**

Flowing Sprinkler Code Node No.	Sprinkler KFactor (K)	Sprinkler Elevation (feet)	Residual Pressure (psi)	Flowing Area (ft²)	Flowing Density (gpm/ft²)	Sprinkler Discharge (gpm)
101	5.60	7.00	7.58	50.00	0.308	15.42
Sub Totals For Non-Group				50.00	0.308	15.42
102	5.60	7.00	7.33	50.00	0.303	15.16
Sub Totals For Non-Group				50.00	0.303	15.16
103	5.60	7.00	7.21	50.00	0.301	15.03
Sub Totals For Non-Group				50.00	0.301	15.03
104	5.60	7.00	7.17	50.00	0.300	15.00
Sub Totals For Non-Group				50.00	0.300	15.00
Totala Fan All Cravina				200.00	0.202	
Totals For All Groups				200.00	0.303	60.62

#### **Fire Sprinkler Output Summary**

#### **Hydraulically Most Demanding Sprinkler Node**

HMD Sprinkler Node Number: 104
HMD Actual Residual Pressure: 7.17 psi
HMD Actual GPM: 15.00 gpm

#### **Sprinkler Summary**

Sprinkler System Type: Dry Specified Area Of Application: 100.00 ft<sup>2</sup> Adjusted Area Of Application: 130.00 ft<sup>2</sup> Minimum Desired Density: 0.300 gpm/ft<sup>2</sup> Application Average Density: 0.606 gpm/ft<sup>2</sup> Application Adjusted Density (not required by NFPA 13): 0.466 gpm/ft<sup>2</sup> Application Average Area Per Sprinkler: 25.00 ft<sup>2</sup> Adjusted Area Per Sprinkler (not required by NFPA 13): 32.50 ft<sup>2</sup> Sprinkler Flow: 60.62 gpm Average Sprinkler Flow: 15.15 gpm

#### **Flow Velocity And Imbalance Summary**

Maximum Flow Velocity (In Pipe 1 - 101)

16.28 ft/sec

Maximum Velocity Pressure (In Pipe 1 - 101)

1.78 psi

Allowable Maximum Nodal Pressure Imbalance:

Actual Maximum Nodal Pressure Imbalance:

O.0100 psi
O.0063 psi
O.0025 psi
O.0025 psi
O.0081 gpm
O.0081 gpm
O.0081 Actual Average Nodal Flow Imbalance:

O.0082 gpm

#### **Overall Network Summary**

Number Of Unique Pipe Sections: 16
Number Of Flowing Sprinklers: 4

Pipe System Water Volume: 22.57 gal

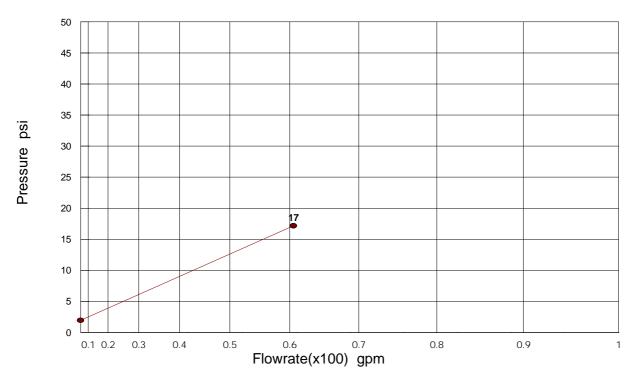
Sprinkler Flow: 60.62 gpm Non-Sprinkler Flow: 0.00 gpm

Minimum Required Residual Pressure At System Inflow
17.19 psi

Node:

Demand Flow At System Inflow Node: 60.59 gpm

#### **Hydraulic Supply/Demand Graph**



#### **Demand Curve Data**

Calculated Residual Pressure: 17.19 psi Calculated Flow Rate: 60.59 gpm

Pressure Required For First Sprinkler Downstream From Inflow Node To Flow: 1.95 psi