



## City of Ketchum

September 19, 2022

Mayor Bradshaw and City Councilors  
City of Ketchum  
Ketchum, Idaho

Mayor Bradshaw and City Councilors:

### **Recommendation to Approve Right-of-Way Encroachment Agreement 22803 for the placement of a snowmelted driveway in the public right-of-way at 600 Walnut Ave.**

#### Recommendation and Summary

Staff recommends the Ketchum City Council approve the attached Right-of-Way Encroachment Agreement 22803 and adopt the following motion:

“I move to authorize the Mayor to sign Right-of-Way Encroachment Agreement 22803 with Glen Valley, LLC.”

#### The reasons for the recommendation are as follows:

- The improvements will not impact the use or operation of Walnut Ave.
- The improvements will not impact drainage or snow removal within the public right-of-way.
- The project complies with all standards for Right-of-Way Encroachment Permit issuance specified in Ketchum Municipal Code §12.12.060.

#### Introduction and History

The property owner submitted a Right-of-Way Encroachment Permit application for snowmelted driveway within the City’s right-of-way along Walnut Ave. The driveway will access a new home located at 600 Walnut Ave within the City’s Limited Residential (LR) Zoning District.

A public right-of-way is defined as improved or unimproved public property dedicated or deeded to the City for the purpose of providing vehicular, pedestrian, and public use. In Ketchum, the public rights-of-way consist of roadways, curbs, gutters, sidewalks, signage, and drainage facilities. The public rights-of-way are also used for public parking, wintertime snow storage, and conveyance of utilities, such as water, sewer, electricity, telephone, and cable.

#### Analysis

Pursuant to Ketchum Municipal Code §12.12.040.C, a Right-of-Way Encroachment Permit is required for any permanent encroachment of the public right-of-way where a permanent fixture to the ground or a building will occur. The associated Right-of-Way Encroachment Agreement is intended to help protect the City in the event the proposed encroachments were to ever pose an issue requiring repair, relocation, or removal of the encroachment. The standards for issuance of a Right-of-Way

Encroachment Permit are specified in Ketchum Municipal Code §12.12.060. The encroachments proposed for the 600 Walnut Ave (McDermott) Residence project comply with all standards.

The snow melt system shall consist of a boiler, modulating mixing valve, zone valves, distribution pump, heat exchanger, supply pump, in-slab snow and ice sensor, and electronic control system. The controls for the snow melt system shall be placed in a visible location in the garage. Controls shall be Tekmar 654 and 090. The snow melt control shall be able to provide slab protection and be capable of a manual, timed, enable.

Snow melt zones will be controlled by the in-slab snow and ice sensor in each zone, The zone will be automatically enabled when the sensor detects moisture, and the outside air temperature is above 10°F and below 40°F. Once the system is enabled, the boiler shall fire and target the supply temperature to the heat exchanger, and the mixing valve shall modulate to maintain a supply temperature of 120°F. The in slab sensor shall disable snowmelt operation if the slab temperature is 50°F or above.

#### Sustainability

The ROW Encroachment Permit does not limit the ability of the city to reach the goals of the Ketchum Sustainability Action Plan – 2020.

#### Financial Impact

There is no financial requirement from the city for this action.

#### Attachments

ROW Encroachment Agreement 22803

**WHEN RECORDED, PLEASE RETURN TO:**

**OFFICE OF THE CITY CLERK  
CITY OF KETCHUM  
POST OFFICE BOX 2315  
KETCHUM, IDAHO 83340**

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**RIGHT-OF-WAY ENCROACHMENT AGREEMENT 22803**

THIS AGREEMENT, made and entered into this \_\_\_\_ day of \_\_\_\_, 2022, by and between the CITY OF KETCHUM, IDAHO, a municipal corporation ("Ketchum"), whose address is Post Office Box 2315, Ketchum, Idaho and Edward H. McDermott, representing Glen Valley, LLC, (collectively referred to as "Owner"), whose mailing address is PO Box 1788, Ross, CA and who owns real property at 600 N Walnut Ave.

*RECITALS*

WHEREAS, Owner is the owner of real property described as 600 N Walnut Avenue ("Subject Property"), located within the City of Ketchum, State of Idaho; and

WHEREAS, Owner wishes to permit placement of a snowmelted driveway within the right-of-way on Walnut Avenue. These improvements are shown in Exhibit "A" attached hereto and incorporated herein (collectively referred to as the "Improvements"); and,

WHEREAS, Ketchum finds that said Improvements will not impede the use of said public right-of-way at this time subject to the terms and provisions of this Agreement;

WHEREAS, the Owner will restore the sidewalk, street, curb and gutter and any landscaping back to the original condition acceptable to the Streets and Facilities Director;

NOW, THEREFORE, in contemplation of the above stated facts and objectives, it is hereby agreed as follows:

*TERMS AND CONDITIONS*

1. Ketchum shall permit Owner to construct, maintain, and repair the Improvements identified in Exhibit "A" within the public right-of-way on Walnut Avenue until notified by Ketchum to remove the infrastructure at which time Owner shall remove infrastructure at Owner's expense.

2. Owner shall be responsible for the maintenance of said Improvements and shall repair said improvements within 48 hours upon notice from Ketchum that repairs are needed. Any modification to the improvements identified in Exhibit "A" shall be approved by the City of Ketchum prior to any modifications taking place.

3. Snowmelt systems installed in the public right-of-way shall be installed and operate at all times during the winter according to the following:
  - The system shall meet the requirements of the International Energy Conservation Code (2018 IECC, 403.12.2)
  - The system shall have an electronic main control board to operate the system that is programmable and optimizes the way the system functions.
  - Installation of in-ground control sensors linked to the main control board that detect snow and ice on the surface, monitor the sidewalk or driveway temperature, and automatically activates the system to be turned on or off based on the snow condition and air temperature.

4. Owner shall be responsible for restoring the sidewalk, curb and gutter and landscaping that is altered due to the construction and installation of the Improvements, to the satisfaction of the Director of Streets and Facilities.

5. In consideration of Ketchum allowing Owner to maintain the Improvements in the public right-of-way, Owner agrees to indemnify and hold harmless Ketchum from and against any and all claims of liability for any injury or damage to any person or property arising from the Improvements constructed, installed and maintained in the public right-of-way. Owner shall further indemnify and hold Ketchum harmless from and against any and all claims arising from any breach or default in the performance of any obligation on Owner's part to be performed under this Agreement, or arising from any negligence of Owner or Owner's agents, contractors or employees and from and against all costs, attorney's fees, expenses and liabilities incurred in the defense of any such action or proceeding brought thereon. In the event any action or proceeding is brought against Ketchum by reason of such claim, Owner, upon notice from Ketchum, shall defend Ketchum at Owner's expense by counsel satisfactory to Ketchum. Owner, as a material part of the consideration to Ketchum, hereby assumes all risk of damages to property or injury to persons in, upon or about the Improvements constructed, installed and maintained in the public right-of-way arising from the construction, installation and maintenance of said Improvements and Owner hereby waives all claims in respect thereof against Ketchum.

6. Ketchum shall not be liable for injury to Owner's business or loss of income therefrom or for damage which may be sustained by the person, goods, wares, merchandise or property of Owner, its tenants, employees, invitees, customers, agents or contractors or any other person in or about the Subject Property caused by or resulting from the Improvements constructed, installed, removed or maintained in the public right-of-way.

7. Owner understands and agrees that by maintaining the Improvements in the public right-of-way pursuant to this Agreement, Owner obtains no claim or interest in said public right-of-way which is adverse to that of Ketchum and that Owner obtains no exclusive right to said public right-of-way nor any other right to use the public right-of-way not specifically described herein.

8. In the event either party hereto retains an attorney to enforce any of the rights, duties and obligations arising out of this Agreement, the prevailing party shall be entitled to recover from the non-prevailing party reasonable attorney's fees at the trial and appellate levels and, whether or not litigation is actually instituted.

9. This Agreement shall be governed by, construed, and enforced in accordance with the laws and decisions of the State of Idaho. Venue shall be in the District Court of the fifth Judicial District of the State of Idaho.

10. This Agreement sets forth the entire understanding of the parties hereto and shall not be changed or terminated orally. It is understood and agreed by the parties hereto that there are no verbal promises or implied promises, agreements, stipulations or other representations of any kind or character pertaining to the Improvements maintained in the public right-of-way other than as set forth in this Agreement.

11. No presumption shall exist in favor of or against any party to this Agreement as the result of the drafting and preparation of this document.

12. This Agreement shall be recorded with the Blaine County Recorder by Ketchum.

13. The parties fully understand all of the provisions of this Agreement, and believe them to be fair, just, adequate, and reasonable, and accordingly accept the provisions of this Agreement freely and voluntarily.

OWNER:

CITY OF KETCHUM:

By: Glen Valley, LLC  
a California limited liability company

By: \_\_\_\_\_

Neil Bradshaw  
Its: Mayor

By: \_\_\_\_\_  
Edward H. McDermott  
Its: Managing Member

STATE OF \_\_\_\_\_, )  
 ) ss.  
County of \_\_\_\_\_ )

On this \_\_\_ day of \_\_\_\_\_, 2022, before me, the undersigned Notary Public in and for said State, personally appeared Edward H. McDermott, known to me to be the Managing Member of Glen Valley, LLC, and the person who executed the foregoing instrument and acknowledged to me that he executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year first above written.

\_\_\_\_\_  
Notary Public for \_\_\_\_\_  
Residing at \_\_\_\_\_  
Commission expires \_\_\_\_\_

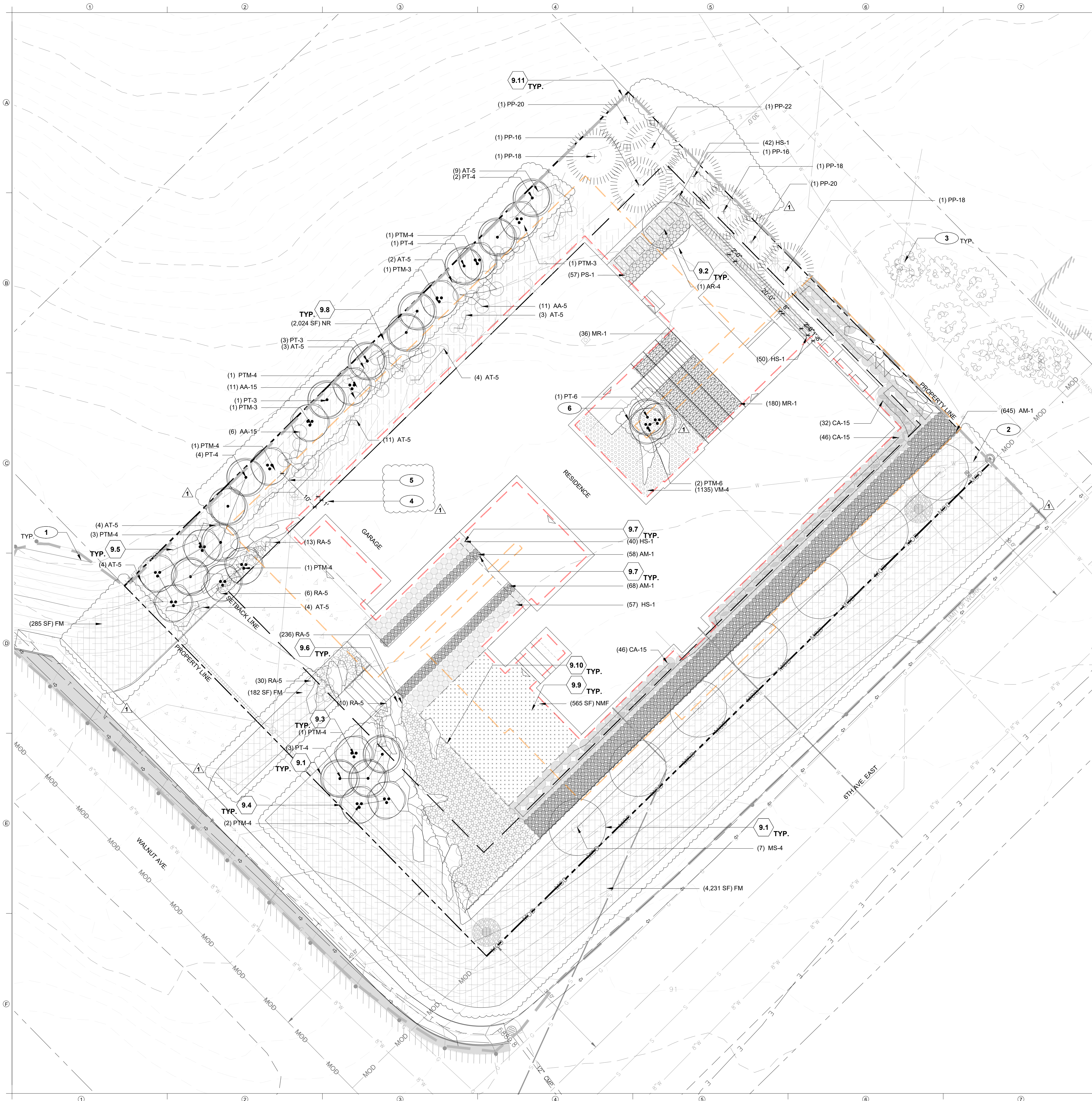
STATE OF IDAHO )  
 ) ss.  
County of Blaine )

On this \_\_\_ day of \_\_\_\_\_, 2022, before me, the undersigned Notary Public in and for said State, personally appeared NEIL BRADSHAW, known or identified to me to be the Mayor of the CITY OF KETCHUM, IDAHO, and the person who executed the foregoing instrument on behalf of said municipal corporation and acknowledged to me that said municipal corporation executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and seal the day and year in this certificate first above written.

\_\_\_\_\_  
Notary Public for \_\_\_\_\_  
Residing at \_\_\_\_\_  
Commission expires \_\_\_\_\_

**EXHIBIT "A"**



**SITE KEYNOTES:**

DETAIL / SHEET	RELATED DETAIL(S)	SPEC. SECTION
9.0	PLANTING AND LANDSCAPE	
9.1	Deciduous Tree Planting on Slope	1/L11-01 ----- 329300
9.2	Deciduous Tree Planting	2/L11-01 ----- 329300
9.3	Deciduous Multi-Stem Tree Planting on Slope	3/L11-01 ----- 329300
9.4	Deciduous Multi-Stem Tree Planting	4/L11-01 ----- 329300
9.5	Shrub Planting on Slope	1/L11-02 ----- 329300
9.6	Shrub Planting	2/L11-02 ----- 329300
9.7	Perennial and Groundcover Planting	3/L11-02 ----- 329300
9.8	Native Seeding	4/L11-02 ----- 329200
9.9	Lawn Turf	5/L11-02 ----- 329200
9.10	Metal Edging	1/L11-03 ----- 329200
9.11	Coniferous Tree Planting on Slope	2/L11-03 ----- 329200
9.12	Coniferous Tree Planting	3/L11-03 ----- 329200

**PLANTING REFERENCE NOTES**

- 1 Refer to Civil Engineer's drawings for all site grading and drainage plan.
- 2 Refer to Civil Engineer's drawings for all utility routing and information.
- 3 Existing tree to remain in place. Do not disturb.
- 4 Wildfire Mitigation - 1 foot offset: 1 foot from base of wall shall be maintained to be clear of all vegetation and vegetative debris.
- 5 Wildfire Mitigation - 10 foot offset: Tree crowns to be maintained and pruned so as to now extend within 10 feet of structures.
- 6 Deciduous trees in courtyard will be well irrigated, limbed 10' in height. The base of trees will keep clean.

**PLANTING KEY LEGEND**

ABBR.	BOTANICAL NAME	COMMON NAME	SPACING
<b>CONIFEROUS TREES</b>			
PPA-16	<i>Pinus ponderosa</i>	Ponderosa Pine	As Shown
PPA-18	<i>Pinus ponderosa</i>	Ponderosa Pine	As Shown
PPA-20	<i>Pinus ponderosa</i>	Ponderosa Pine	As Shown
PPA-22	<i>Pinus ponderosa</i>	Ponderosa Pine	As Shown
<b>DECIDUOUS TREES</b>			
AR-4	<i>Acer rubrum</i>	Red Maple	As Shown
PT-3	<i>Populus tremuloides</i>	Quaking Aspen (Single-Stem)	As Shown
PT-4	<i>Populus tremuloides</i>	Quaking Aspen (Single-Stem)	As Shown
PT-6	<i>Populus tremuloides</i>	Quaking Aspen (Single-Stem)	As Shown
PTM-3	<i>Populus tremuloides</i>	Quaking Aspen (Multi-Stem)	As Shown
PTM-4	<i>Populus tremuloides</i>	Quaking Aspen (Multi-Stem)	As Shown
PTM-6	<i>Populus tremuloides</i>	Quaking Aspen (Multi-Stem)	As Shown
MR-4	<i>Malus 'Radiant'</i>	Radiant Crabapple	As Shown
<b>SHRUBS</b>			
AA-15	<i>Amelanchier alnifolia</i>	Western Serviceberry	As Shown
CA-15	<i>Cotoneaster acutifolia</i>	Peking Cotoneaster	30" O.C.
RA-5	<i>Rhus aromatica 'Gro-Low'</i>	Fragrant Sumac	18" O.C.
AT-5	<i>Artemisia tridentata</i>	Western Sagebrush	As Shown
<b>PERENNIALS &amp; GROUNDCOVERS</b>			
AM-1	<i>Achillea millefolium</i>	Yarrow	12" O.C.
MR-1	<i>Mahonia repens</i>	Creeeping Mahonia	12" O.C.
HS-1	<i>Helictotrichon sempervirens</i>	Blue Oat Grass	12" O.C.
PS-1	<i>Penstemon strictus</i>	Rocky Mountain Penstemon	12" O.C.
VM-4	<i>Vinca minor</i>	Common Periwinkle	6" O.C.
<b>TURF AND GRASSES</b>			
NMF	No Mow Fescue		
	<i>Festuca rubra</i>	Red Fescue	
	<i>Festuca rubra commutata</i>	Chewings Fescue	
	<i>Festuca ovina</i>	Sheep Fescue	
NR	Native Revegetation		
	<i>Bromus carinatus</i>	Mountain Brome	
	<i>Festuca ovina duriscuscula</i>	Hard Fescue	
	<i>Pseudoroegneria spicata</i>	Blue Bunch Wheatgrass	
<b>FM</b>			
	<i>Festuca rubra</i>	Red Fescue	
	<i>Festuca rubra commutata</i>	Chewings Fescue	
	<i>Festuca ovina</i>	Sheep Fescue	

NOTE:  
 1. Refer to General Information Sheet L0-01 and L0-02 for General and Series Specific Notes, Legends, Abbreviations, Lists, Schedules.  
 2. **PRINT PAGE IN COLOR.**

**DESIGNWORKSHOP**

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**McDERMOTT RESIDENCE  
 600 WALNUT AVE.  
 KETCHUM, IDAHO**

THE STRUCTURAL ENGINEER'S STAMP ON THESE DRAWINGS IS RELATED TO ONLY STRUCTURAL ELEMENTS OF DESIGN. REFERENCE THE GENERAL NOTES FOR A LIST OF INCLUDED COMPONENTS.

THE LANDSCAPE ARCHITECT'S STAMP ON THESE DRAWINGS IS NOT RELATED TO STRUCTURAL ELEMENTS OF DESIGN.

ISSUE DATE: JUNE 28, 2022

REVISIONS		
#	DATE	DESCRIPTION
1	09/13/22	REV 01

DRAWN: JW, JP REVIEWED: MA/BR

**BUILDING PERMIT**

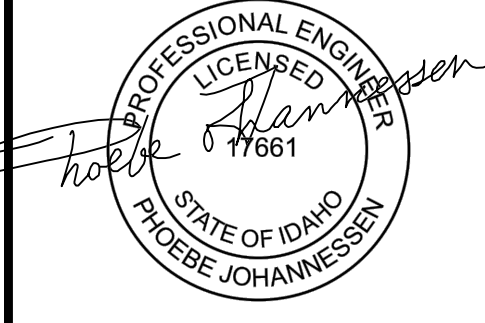
PROJECT NUMBER: 6530

**SITE PLANTING PLAN**

SHEET NUMBER

**L8-01**





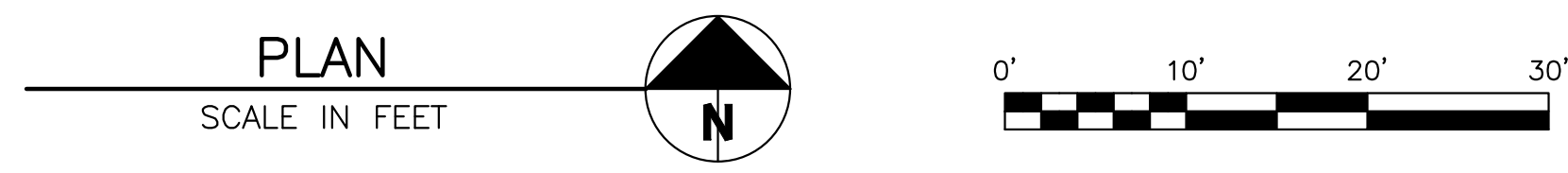
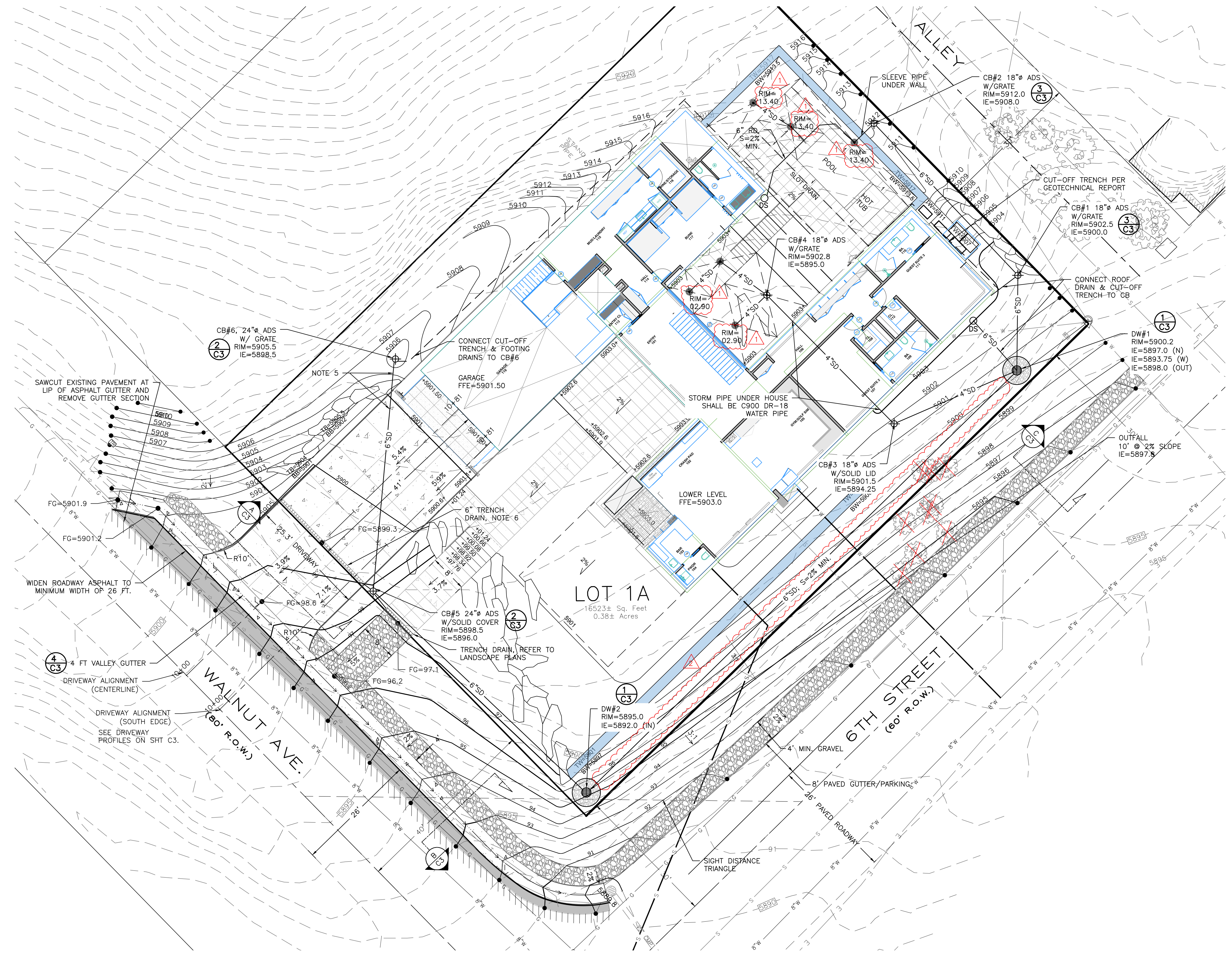
8/17/22

- GENERAL NOTES**
- CONTRACTOR SHALL FIELD VERIFY LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING CONSTRUCTION. ANY CONFLICT SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
  - CONTRACTOR SHALL NOTIFY DIGLINE (1-800-342-1585) AT LEAST 48 HOURS PRIOR TO BEGINNING CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO EXISTING UTILITIES ENCOUNTERED DURING CONSTRUCTION.
  - CONTRACTOR SHALL BE RESPONSIBLE FOR DUST CONTROL DURING THE CONSTRUCTION OF ALL ITEMS HEREON. DUST CONTROL SHALL BE CONTINUOUS DURING CONSTRUCTION, 24 HOURS PER DAY 7 DAYS PER WEEK.
  - CONTRACTOR SHALL ASSURE POSITIVE DRAINAGE AWAY FROM THE HOUSE.
  - SLEEVE STORM DRAIN UNDER WALL WITH 10-FT SECTION OF PVC PIPE CENTERED UNDER WALL.
  - TRENCH DRAIN SHALL BE A 6" WIDE HDPE CHANNEL WITH A 0.75" BUILT IN CHANNEL SLOPE (ZURN FLO-THRU MODEL Z886 OR EQUIVALENT). GRATE SHALL BE DUCTILE IRON WITH A SLOTTED PATTERN. CATCH BASIN SHALL BE 6" WIDE X 20" LONG X 20" DEEP AND SHALL BE MADE OF HDPE. OUTLET PIPE SHALL BE 4" DIAMETER. (FLO-THRU MODEL Z887 OR EQUIVALENT). ALL COMPONENTS SHALL BE RATED FOR H2O LOADING.
  - DIRECT ROOF DRAINS TO DRYWELL#1
  - 24" ADS CATCH BASINS SHALL BE PER DETAIL 2, SHT C3.
  - 18" ADS CATCH BASINS SHALL BE PER DETAIL 3, SHT C3.
  - ALL WORK WITHIN THE CITY RIGHT OF WAY SHALL CONFORM TO CITY OF KETCHUM STANDARDS.

ESTIMATE OF CUT/FILL VOLUMES:  
 CUT: 2,000 CY  
 FILL: 0 CY

**LEGEND**

PROPERTY LINE	---
ADJOINING PROPERTY LINE	---
CENTERLINE	---
SEWER	---
SEWER MANHOLE	⊙
WATER	---
GAS	---
POWER	---
TELEPHONE	---
EXISTING CONTOUR	---5775---
PROPOSED CONTOUR	---5775---
SAWCUT LINE	---
FLOW LINE	---
DRYWELL	⊙
STORM DRAIN PIPE	4"SD
CUT-OFF TRENCH	DS
DOWN SPOUT	⊙
ADS CATCH BASIN	⊙
AREA DRAIN	⊙
EXIST TREE TO BE REMOVED	⊙
EXIST IRRIGATION BOX	⊙
ASPHALT PAVEMENT	▒
CONCRETE PAVEMENT	▒
GRAVEL	▒
FG	---
EG	---
ME	---
IPCO	---
	FINISHED GRADE
	EXISTING GROUND
	MATCH EXISTING
	IDAHO POWER CO.



**REVISIONS**

No.	DESCRIPTION	DATE	BY
1	CITY COMMENTS	8/17/22	PLJ
2	CITY COMMENTS	9/9/22	PLJ

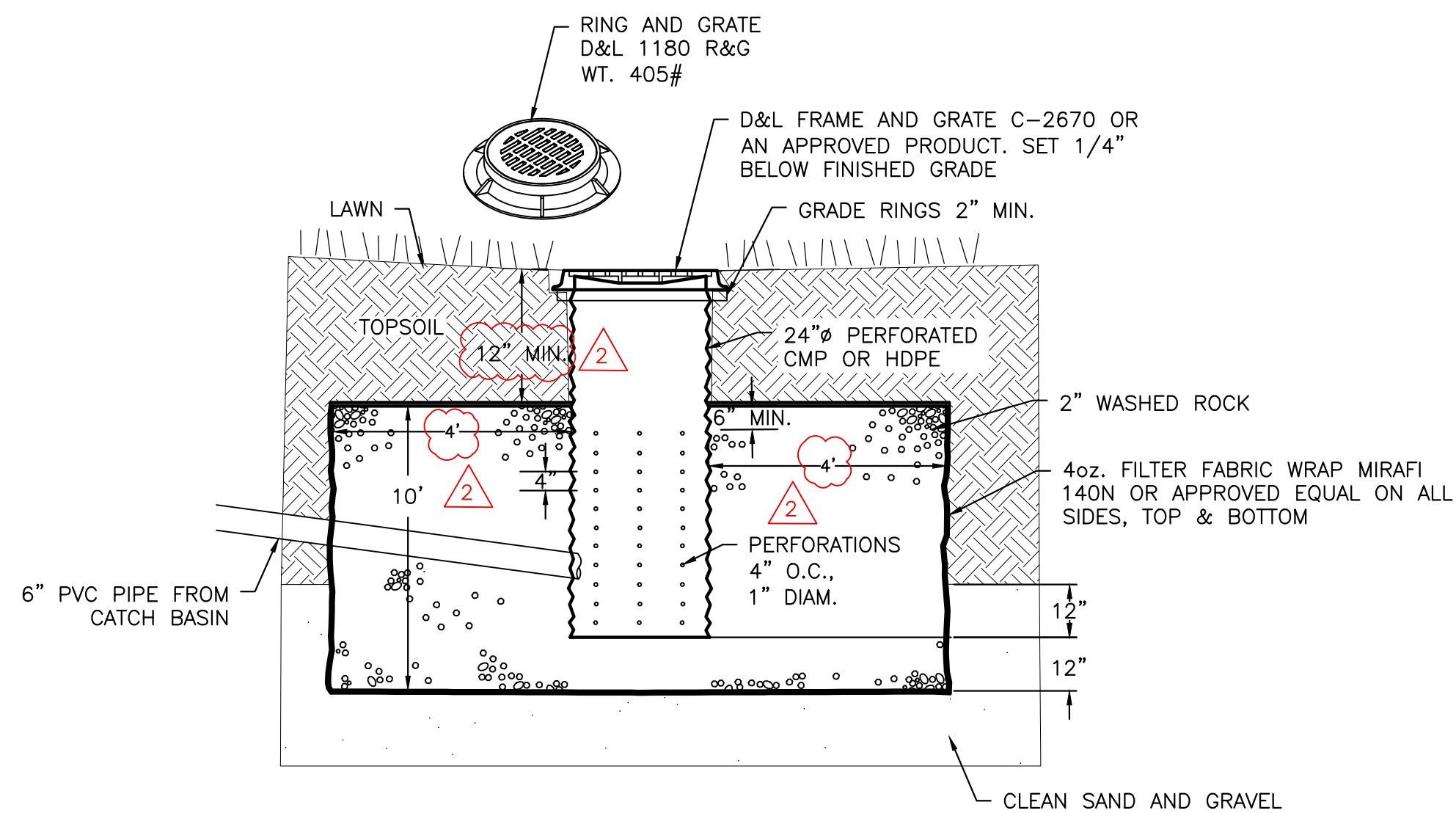


PREPARED BY:  
 BENCHMARK ASSOCIATES, P.A.  
 P.O. BOX 733 100 BELL DRIVE  
 KETCHUM, IDAHO 83340  
 (208) 726-9512  
 FAX 726-9514  
 WEB: WWW.BMASB.COM  
 MAIL: WWW.BMASB.COM

**GRADING & DRAINAGE PLAN**  
 KETCHUM TOWNSITE BL 91, LOT 1A  
 T4N, R18E, SEC 18, B.M., KETCHUM, IDAHO  
 PREPARED FOR: CLB ARCHITECTS

DRAWN BY: PLJ  
 DESIGNED BY: PLJ  
 CHECKED BY: SB  
 DATE: 8/17/2022  
 PROJECT NO.: 21047

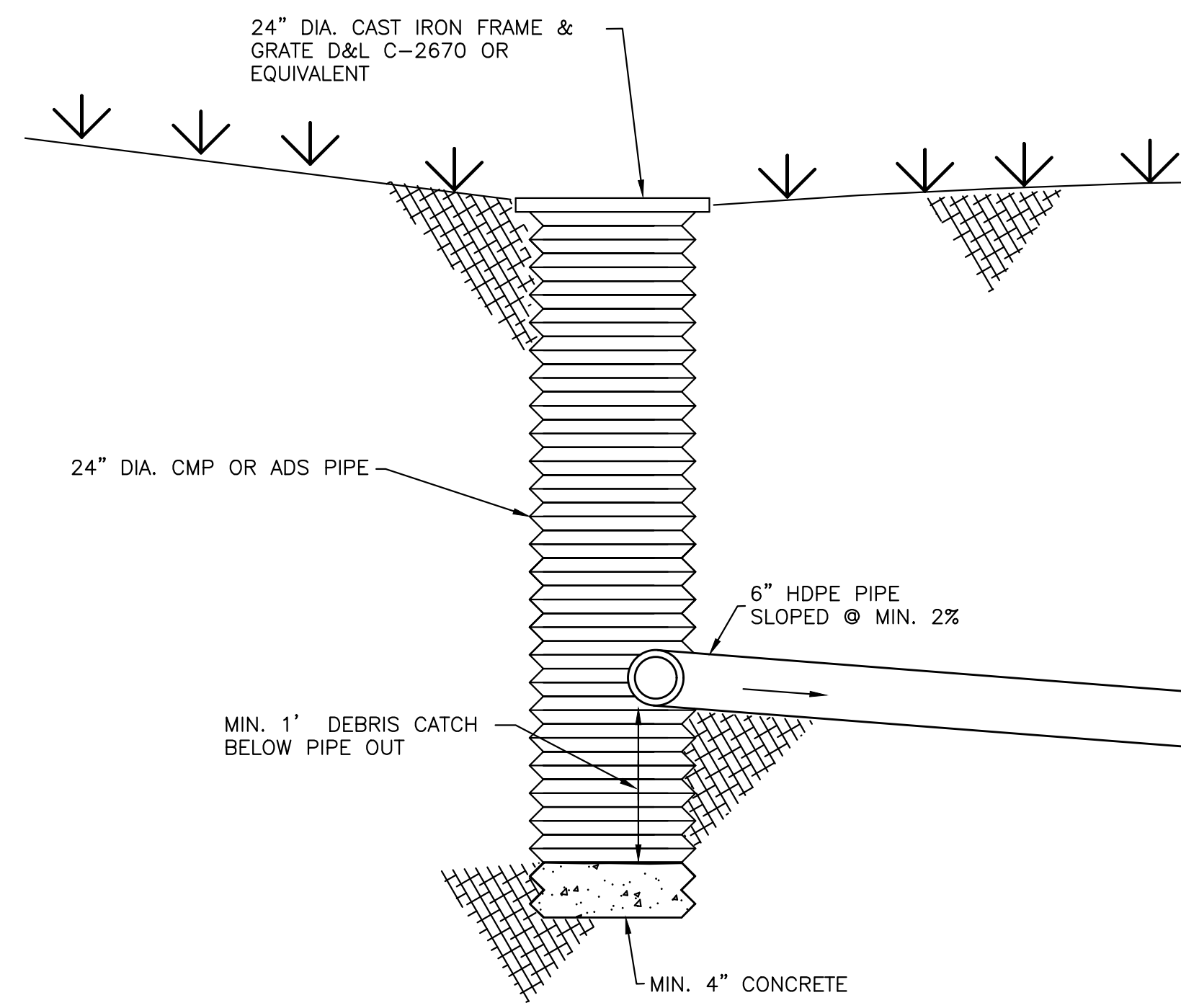
DRAWING NO.  
**C1**



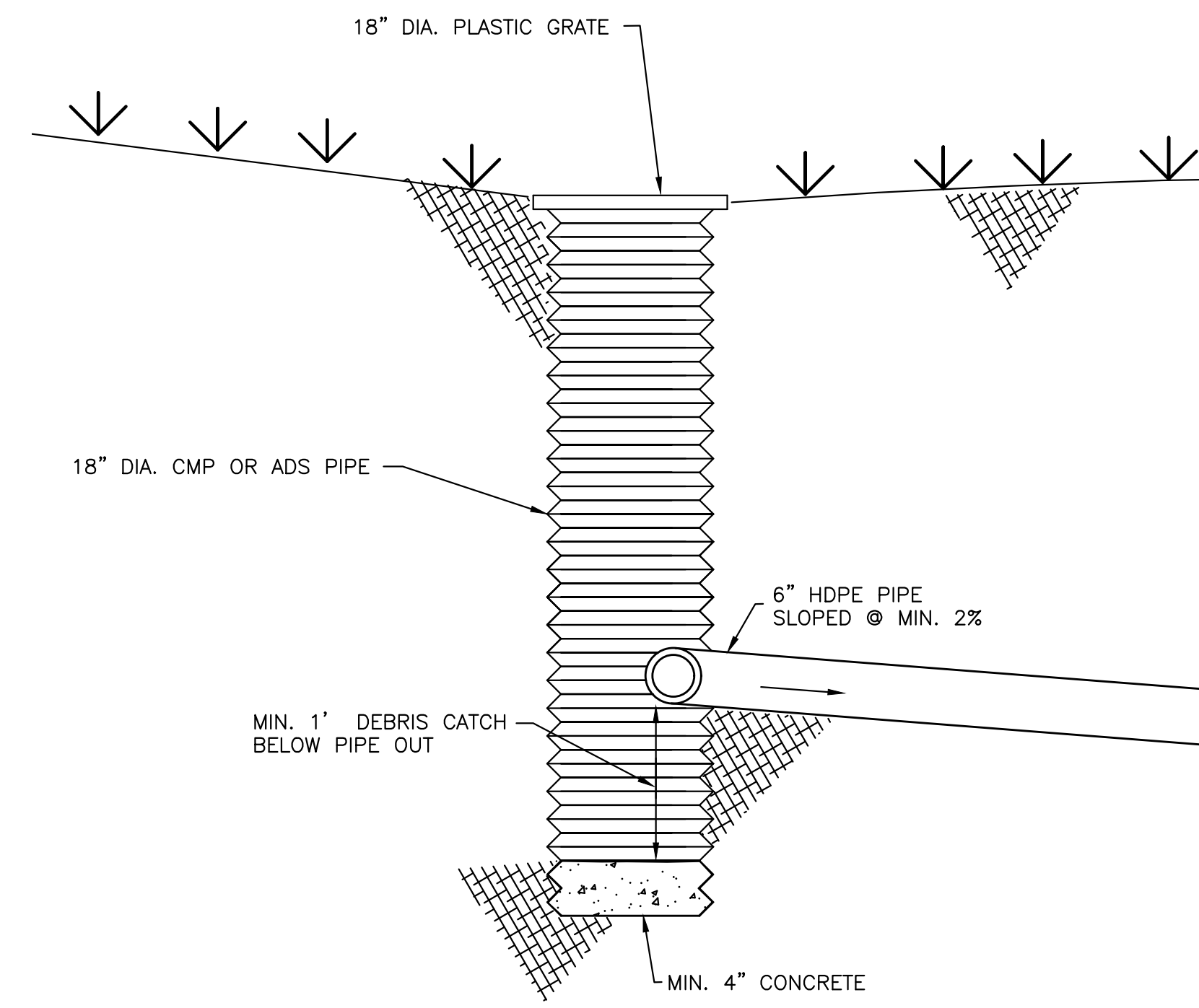
**NOTES:**

1. THE BED SHALL BE EXCAVATED A MINIMUM OF 24" INTO CLEAN SAND AND GRAVEL.
2. MAXIMUM DEPTH SHALL NOT EXCEED 12 FEET.
3. IF CLEAN SAND AND GRAVEL IS NOT ENCOUNTERED WITHIN 12 FEET, THE CONTRACTOR SHALL CONTACT THE DESIGN ENGINEER.
4. USE RING AND GRATE.

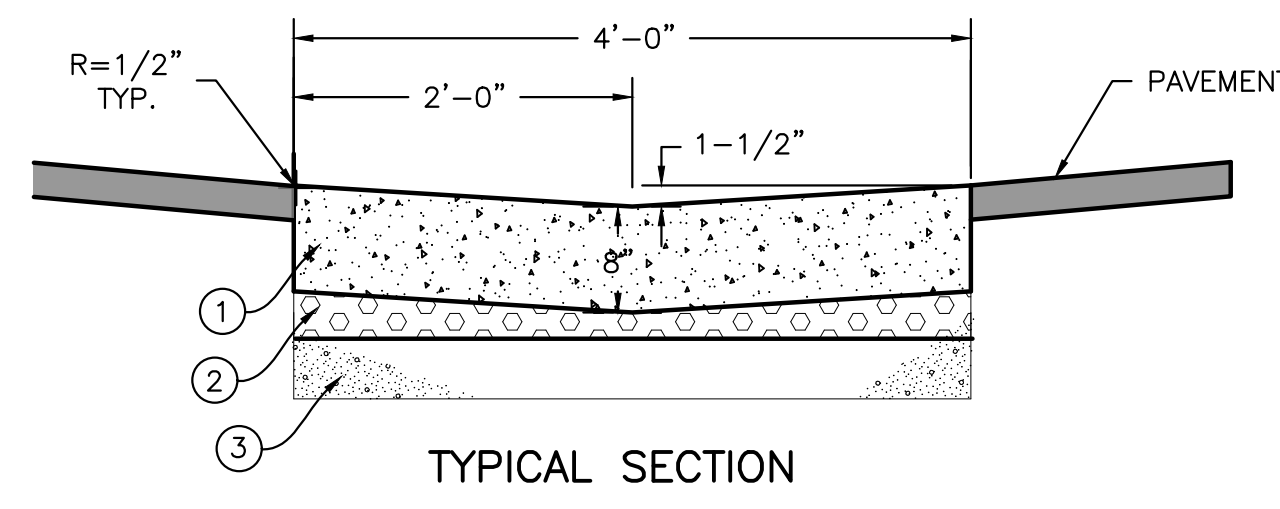
**1 TYPICAL DRYWELL DETAIL**  
SCALE: NONE



**2 24-INCH ADS CATCH BASIN**  
SCALE: NONE



**3 18-INCH ADS CATCH BASIN**  
SCALE: NONE



**TYPICAL SECTION**

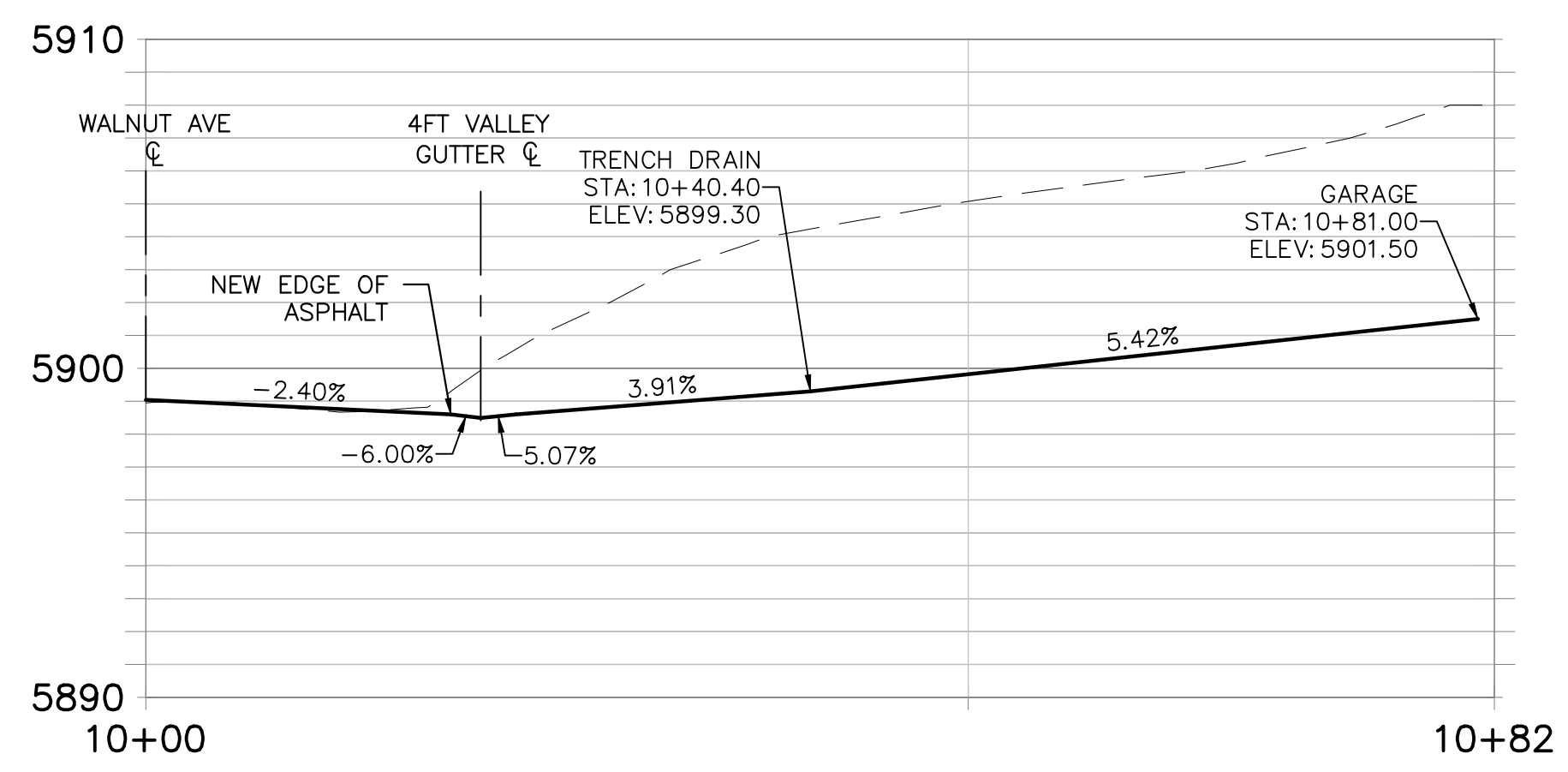
**LEGEND**

- 1 8-INCH THICK CONCRETE
- 2 2" MIN. OF 3/4" TYPE 1 AGGREGATE BASE
- 3 6" OF 2" TYPE II SUBBASE

**NOTES:**

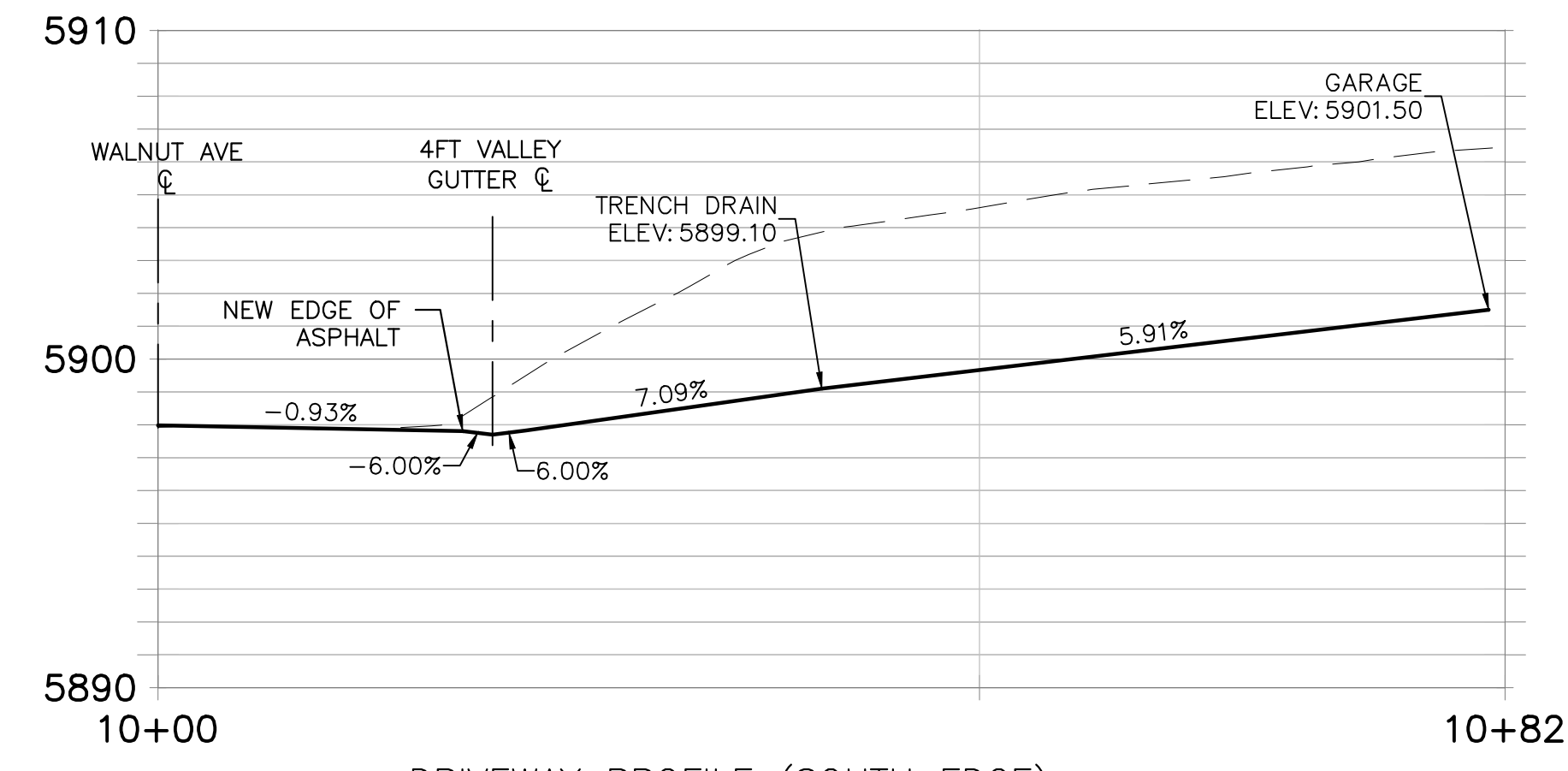
1. 1/2-INCH PREFORMED EXPANSION JOINT MATERIAL (AASHTO M 213) AT TERMINAL POINTS OF RADII.
2. CONTINUOUS PLACEMENT PREFERRED. SCORE INTERVALS TO MATCH SIDEWALK WITH 10-FOOT MAXIMUM SPACING.
3. MATERIALS SHALL CONFORM WITH CURRENT ISPCW STANDARDS, DIVISION 800 AGGREGATES AND ASPHALT.

**4 4 FT CONCRETE VALLEY GUTTER**  
SCALE: N.T.S.



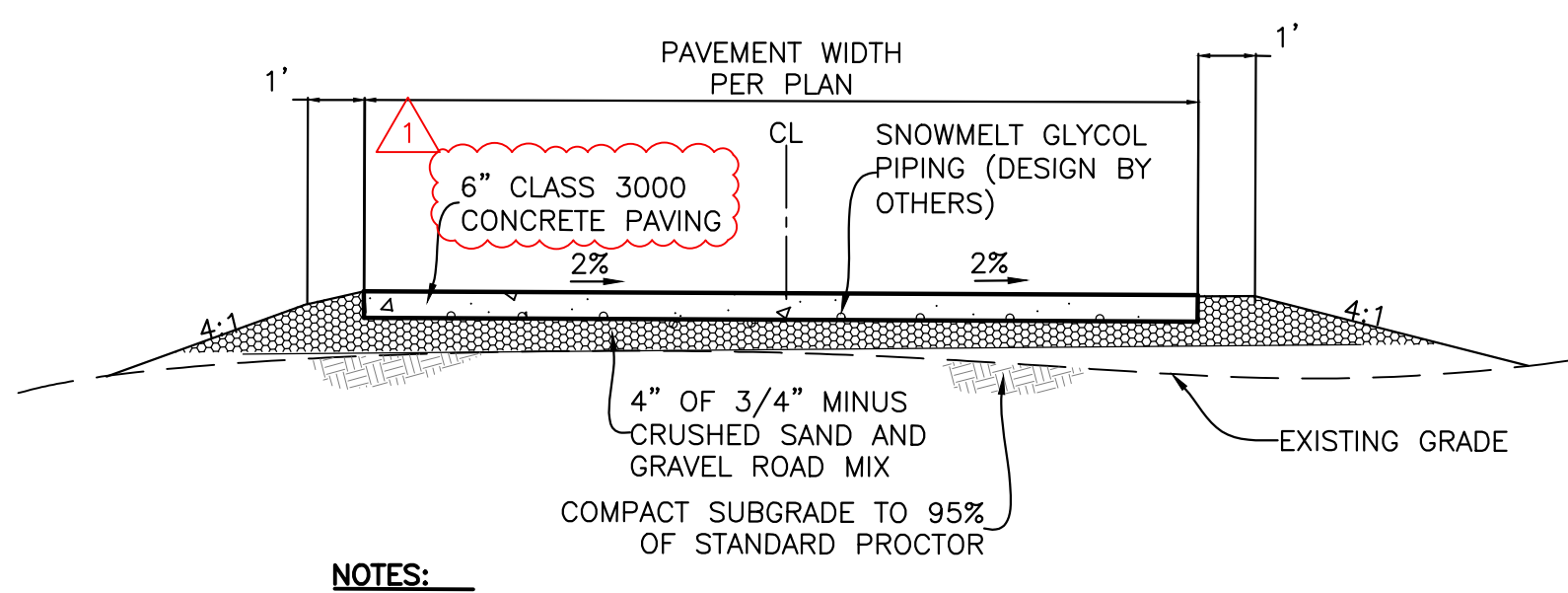
**CENTERLINE DRIVEWAY PROFILE**

HORIZ: 1"=10'  
VERT: 1"=5'



**DRIVEWAY PROFILE (SOUTH EDGE)**

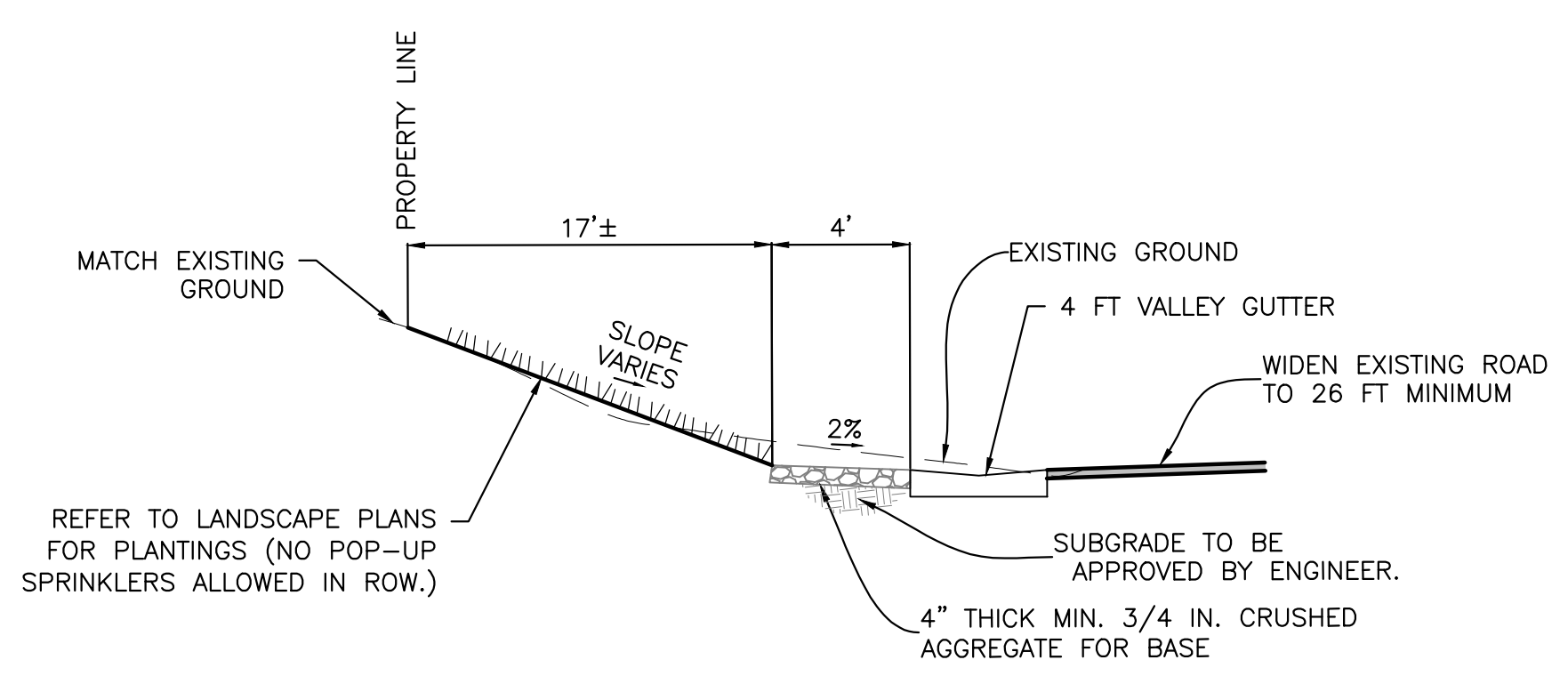
HORIZ: 1"=10'  
VERT: 1"=5'



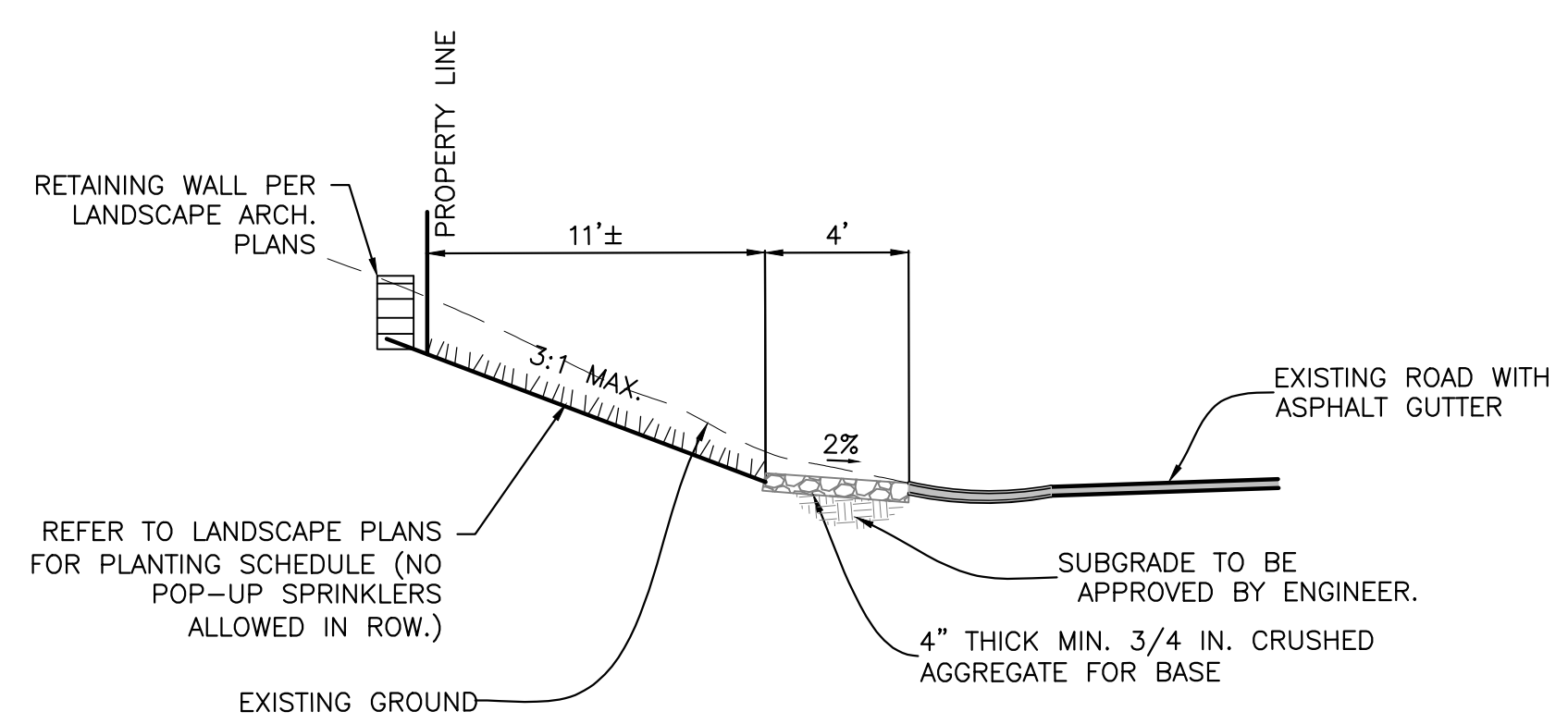
**NOTES:**

1. COMPACT DRIVEWAY SUBGRADE AND ALL STRUCTURAL FILL MATERIAL TO AT LEAST 95% OF THE MAXIMUM DENSITY OF EACH MATERIAL ACCORDING TO STANDARD PROCTOR ASTM D-698.

**A DRIVEWAY SECTION**  
SCALE: NONE



**B ROAD SHOULDER SECTION (WALNUT AVE)**  
SCALE: NONE



**C ROAD SHOULDER SECTION (6TH STREET)**  
SCALE: NONE

PROFESSIONAL ENGINEER  
LICENSED IN THE STATE OF IDAHO  
PHOENIX JOHANNESSEN  
8/17/22

REVISIONS	No.	DESCRIPTION	DATE	BY
	1	CHANGED DRIVEWAY TO CONCRETE	8/17/22	PLJ
	2	DRYWELL REVISION	9/11/22	PLJ

**BENCHMARK ASSOCIATES**  
PREPARED BY:  
BENCHMARK ASSOCIATES, P.A.  
P.O. BOX 733 100 BELL DRIVE  
KETCHUM, IDAHO 83340  
(208) 726-9512  
FAX: 726-9514  
WEB: WWW.BMA5B.COM  
MAIL: WWW.BMA5B.COM

**ROAD & DRAINAGE DETAILS**  
KETCHUM TOWNSITE BL 91, LOT 1A  
T4N, R18E, SEC 18, B.M., KETCHUM, IDAHO  
PREPARED FOR: CLB ARCHITECTS

DRAWN BY: PLJ  
DESIGNED BY: PLJ  
CHECKED BY:  
DATE: 8/17/2022  
PROJECT NO.: 21012

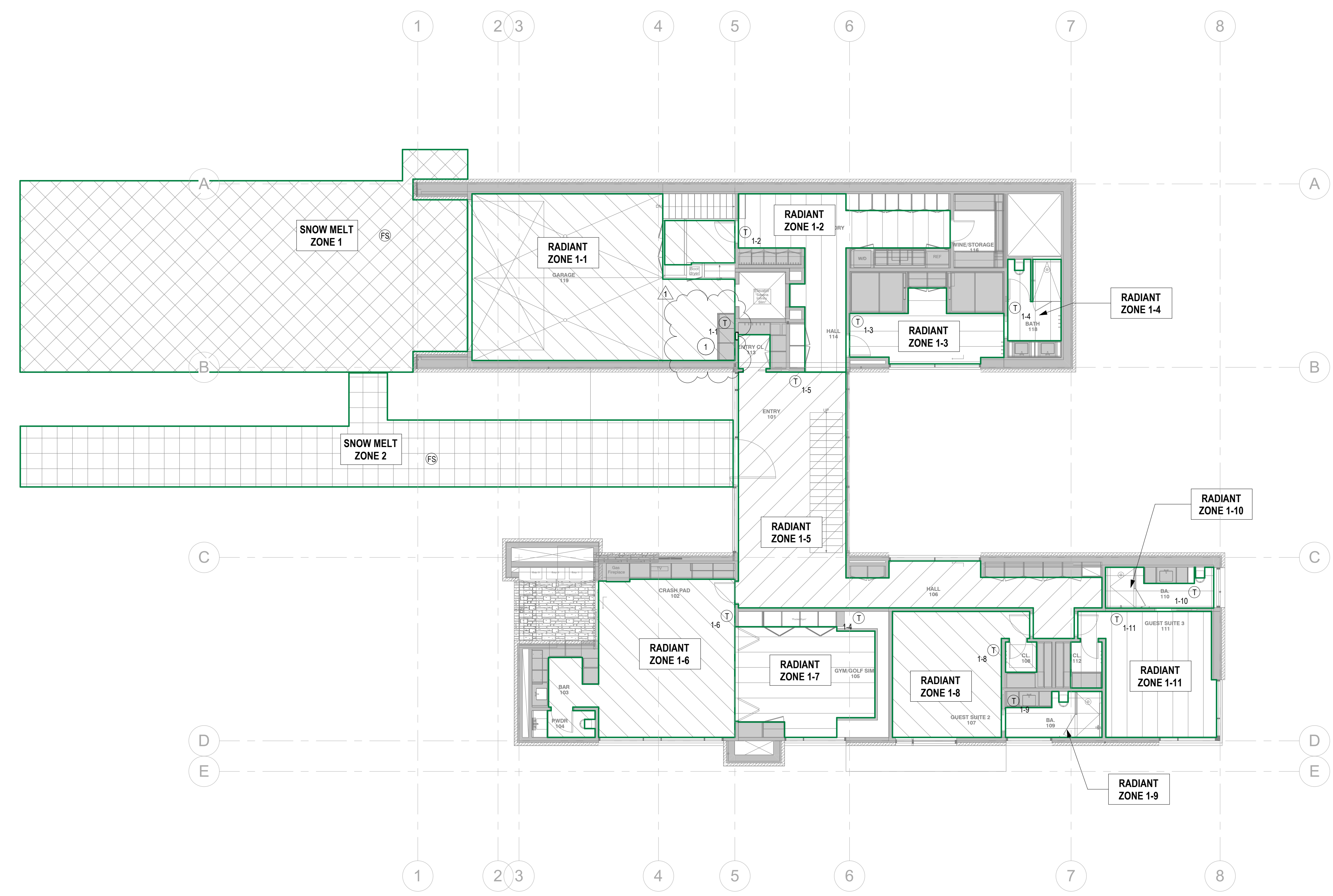
DRAWING NO.  
**C3**

**KEYED NOTES**

1 PROVIDE CONTROLS FOR SNOWMELT SYSTEM ON GARAGE WALL.



Energy 1



1 LOWER LEVEL RADIANT ZONING PLAN  
M1.3 SCALE: 1/8" = 1'-0"

**McDermott Residence**  
Ketchum, ID

1626.00

Issue/Revision Date	
100% CD	06-13-22
REVISION 1	08-26-22

Drawn By: TM Checked B/Checker

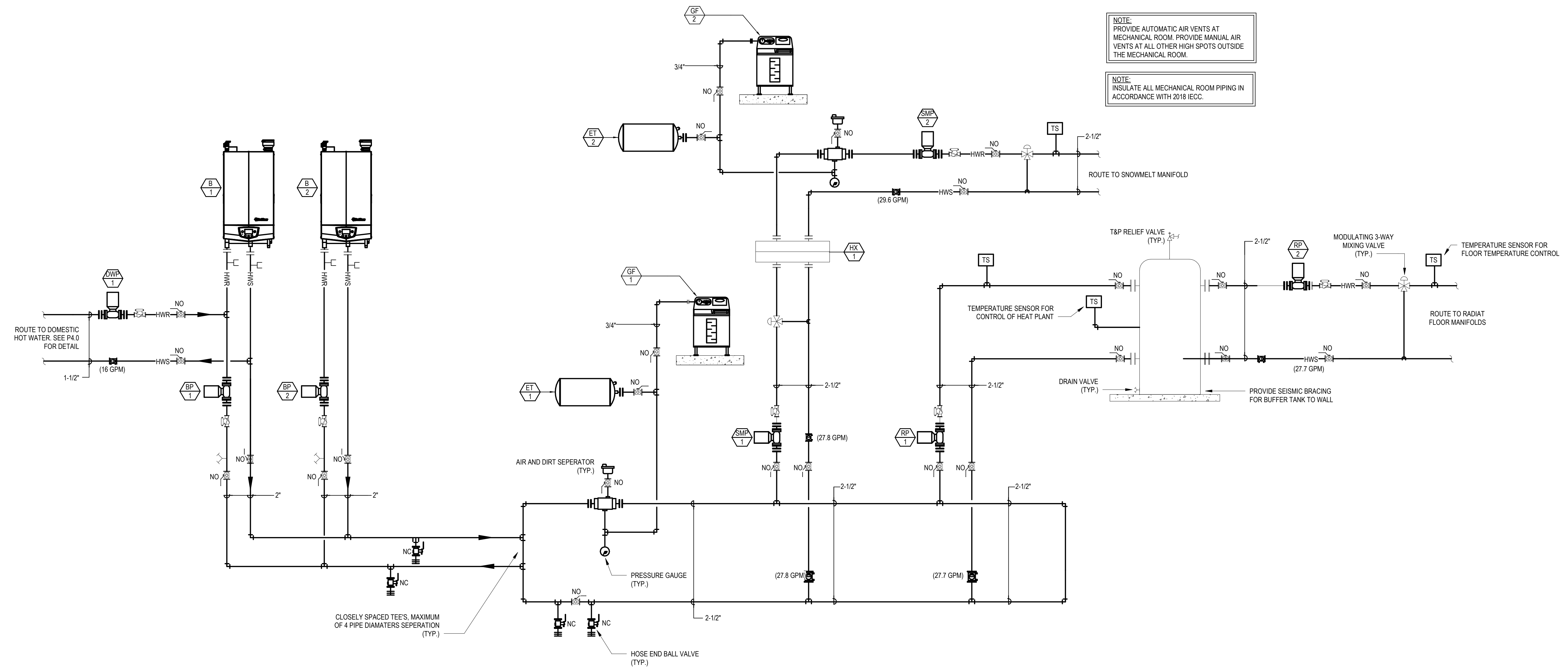
LOWER LEVEL RADIANT ZONING PLAN

**M1.3**

Drawing Reference:



Energy 1



1 BOILER PIPING SCHEMATIC  
M7.1 SCALE: NTS

**McDermott Residence**  
Ketchum, ID

1626.00

Issue/Revision Date	100% CD	06-13-22
REVISION 1		08-26-22

Drawn By: TM Checked BChecker

BOILER PIPING SCHEMATIC

**M7.1**

Drawing Reference:



Energy 1

**McDermott Residence**  
Ketchum, ID

1626.00

Issue/Revision Date	
100% CD	06-13-22
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MECHANICAL CONTROL SEQUENCES

**M8.0**

Drawing Reference:

## FORCED AIR HEATING & COOLING SEQUENCE OF OPERATIONS

**1. GENERAL**  
THE FORCED AIR SYSTEM SHALL CONSIST OF OUTDOOR AIR SOURCE HEAT PUMPS, INDOOR FAN COIL UNITS, DUCT HEATERS, AND ASSOCIATED DUCT WORK AND DAMPERS.

**2. OPERATION**  
UPON A CALL FOR SECONDARY HEAT FROM THE THERMOSTAT, THE RESPECTIVE FAN COIL AND AIR SOURCE HEAT PUMP SHALL BE ENABLED. IF THE (FIELD ADJUSTABLE) OUTDOOR AIR TEMPERATURE HAS THE HEAT PUMP IN LOCK OUT, THE ELECTRIC STRIP HEATERS OR DUCT HEATER SHALL BE ENABLED.

UPON A CALL FOR COOLING FROM THE THERMOSTAT AND IF ALL RESPECTIVE RADIANT THERMOSTATS ARE NOT CALLING FOR HEAT IN THE OVERLAPPING FORCED AIR ZONE, THE RESPECTIVE FAN COIL AND AIR SOURCE HEAT PUMP SHALL BE ENABLED.

WHEN THE ZONE IS SATISFIED, THE OPERATION SHALL BE REVERSED.

LOW AND HIGH LIMIT SAFETY'S WILL BE BASED ON AIR TEMPERATURE DOWNSTREAM OF THE COIL IN THE SUPPLY DUCT OF FCU.

## MAKE-UP AIR SEQUENCE OF OPERATIONS

**1. GENERAL**  
THE MAKE-UP AIR SYSTEM SHALL BE COMPRISED OF A FAN COIL UNIT FCU-10, MODULATING CONTROL DAMPERS, ELECTRIC DUCT HEATERS MUA-1 AND MUA-2, CURRENT SENSING RELAY, AND A PUSH BUTTON TIMER.

**2. OPERATION**  
FCU-10 UNDER NORMAL OPERATION SHALL PROVIDE HEATING/COOLING BASED ON ROOM TEMPERATURE SENSOR AND T-STAT. THE MOTORIZED OUTSIDE AIR DAMPERS SHALL BE NORMALLY CLOSED AND RETURN AIR DAMPER NORMALLY OPEN.

IF THE RANGE EXHAUST HOOD IS ENGAGED THE RETURN AIR DAMPER, CD-3, SHALL MODULATE TO 77% CLOSED AND THE OUTSIDE AIR DAMPER, CD-1, SHALL MODULATE TO 100% OPEN. FCU-10 SHALL BE SET TO PROVIDE 1200 CFM TO THE ZONE.

IF THE WOOD BURNING PUSH BUTTON TIMER IS ENGAGED, THE RETURN AIR DAMPER SHALL MODULATE TO 23% CLOSED AND THE OUTSIDE AIR DAMPER, CD-2, SHALL MODULATE TO 100% OPEN. FCU-10 SHALL BE SET TO PROVIDE 350 CFM TO THE ZONE.

IF BOTH THE RANGE EXHAUST HOOD AND PUSH BUTTON TIMER ARE ENGAGED, THE RETURN AIR DAMPER SHALL MODULATE TO 100% CLOSED, CD-3 SHALL MODULATE TO 100% CLOSED, CD-1 AND CD-2 SHALL MODULATE TO 100% OPEN, AND FCU-10 WILL BE SET TO PROVIDE 1550 CFM OF AIR TO THE ZONE.

DUCT HEATER SHALL MODULATE TO MAINTAIN A LAT OF 70°F.

THE DUCT HEATER SHALL BE PROVIDED WITH DISCHARGE AIR FREEZE-STATS THAT IF ENABLED WILL CLOSE THE OUTSIDE AIR DAMPER, SHUT THE HEATER OFF, AND OPEN THE RETURN AIR DAMPER.

## THERMOSTAT OVERVIEW

**1. GENERAL**  
THE THERMOSTATS SHALL BE TEKMAR INVITA CAPABLE OF 3H, 2C OPERATION AND CONTROLLING THE FAN COIL UNIT FAN, HUMIDIFIER, AND ERV. THE THERMOSTATS SHALL BE CAPABLE OF REMOTE MONITORING AND TEMPERATURE ADJUSTMENT.

## HEATING PLAN SEQUENCE OF OPERATIONS

**1. GENERAL**  
THE HEATING PLAN SHALL CONSIST OF ONE NATURAL GAS BOILER, A BUFFER TANK, MANIFOLDS, HEAT EXCHANGER, AND ASSOCIATED DISTRIBUTION INCLUDING PUMPS AND CONTROL VALVES. CONTROLS TO BE TEKMAR.

**2. OPERATION**  
THE NATURAL GAS BOILER SHALL BE ENABLED AND STAGED TO MAINTAIN A FIELD ADJUSTABLE SET POINT IN THE BUFFER TANK BASED ON OUTDOOR TEMPERATURE RESET NOT TO EXCEED 120°F. ONCE THE BUFFER TANK TEMPERATURE DROPS 5°F, THE PROPANE BOILER AND INJECTION PUMP SHALL BE ENABLED. THE INJECTION PUMP WILL MODULATE TO MAINTAIN A SUPPLY TEMPERATURE OF 120°F. ONCE THE TANK REACHES 120°F THE EQUIPMENT SHALL BE STAGED OFF.

PRIMARY HEATING IS VIA THE HYDRONIC SYSTEM. UPON A CALL FROM THE THERMOSTAT, THE CONTROL VALVES AT THE MANIFOLDS SHALL BE OPENED AND THE DISTRIBUTION PUMP SHALL BE PROGRAMMED INTO A PROPORTIONAL PRESSURE OPERATION SET AT (FIELD ADJUSTABLE) 5.1GPM. THE PUMP SHALL BE AUTOMATICALLY ENABLED WHEN THE VALVES ARE OPENED.

THE SEQUENCE OF OPERATIONS FOR THE HEAT PLANT SHALL RESTART AFTER ROOM SET POINT IS SATISFIED.

THE NATURAL GAS BOILERS SHALL BE STAGED AND MODULATING USING THE ON BOARD CONTROLS TO MAINTAIN THE FOLLOWING SUPPLY WATER TEMPERATURES:

RADIANT: 120F  
SNOW MELT: 160F  
DOMESTIC HOT WATER: 180F

## SNOW MELT SEQUENCE OF OPERATIONS

**1. GENERAL**  
THE SNOW MELT SYSTEM SHALL CONSIST OF A BOILER, MODULATING MIXING VALVE, ZONE VALVES, DISTRIBUTION PUMP, HEAT EXCHANGER AND SUPPLY PUMP, AND IN-SLAB SNOW AND ICE SENSOR.

**2. OPERATION**  
SNOW MELT ZONES WILL BE CONTROLLED BY THE IN-SLAB SNOW AND ICE SENSOR IN EACH ZONE. THE ZONE WILL BE AUTOMATICALLY ENABLED WHEN THE SENSOR DETECTS MOISTURE, THE SLAB TEMPERATURE IS LESS THAN 50°F, AND THE OUTSIDE AIR TEMPERATURE IS ABOVE 10°F AND BELOW 40°F. ONCE THE SYSTEM IS ENABLED THE BOILER SHALL FIRE AND TARGET THE SUPPLY TEMPERATURE TO THE HEAT EXCHANGER AND THE MIXING VALVE SHALL MODULATE TO MAINTAIN A SUPPLY TEMPERATURE OF 120°F. THE SNOW MELT CONTROL SHALL BE ABLE TO PROVIDE SLAB PROTECTION AND BE CAPABLE OF A MANUAL, TIMED, ENABLE.

THE SNOW MELT SYSTEM SHALL BE DISABLED WHILE THE RESIDENCE IS UNOCCUPIED AND LARGE ACCUMULATIONS OF SNOW SHALL BE MANUALLY REMOVED PRIOR TO ENABLING THE SNOW MELT SYSTEM.

CONTROLS BASED ON TEKMAR 654 AND 090.

## RADIANT HEATING SEQUENCE OF OPERATIONS

**1. GENERAL**  
THE RADIANT HEATING SYSTEM SHALL CONSIST OF BALANCING MANIFOLDS WITH ZONE VALVES OR THERMAL ACTUATORS AND DISTRIBUTION PUMP.

**2. OPERATION**  
UPON A CALL FOR HEATING FROM THE ROOM THERMOSTAT, THE CONTROL VALVE AT THE MANIFOLD SHALL BE OPENED. THE DISTRIBUTION PUMP SHALL BE AUTOMATICALLY ENABLED WHEN VALVES ARE OPENED. RADIANT HEAT SHALL BE THE PRIMARY HEAT SOURCE THROUGHOUT THE BUILDING. IN ZONES WITH SUPPLEMENTAL FORCED AIR HEATING, THE THERMOSTAT IN THE OVERLAPPING RADIANT ZONE WILL CONTROL BOTH STAGES OF HEAT.