

# Natatorium Roof Framing Visual Condition Assessment for the

## City of Bozeman's **Swim Center**

**1211 W Main St.  
Bozeman, MT 59715**

Reported to:

Mike Gray, Facilities Superintendent  
Max Ziegler, Facilities Project Coordinator

Prepared by:



Morrison-Maierle, Inc.  
Project #: 0417.091

Rebecca Scheetz, PE  
Austin Batson, EI  
Jay Fischer, PE

April-May 2022

## **BACKGROUND**

On January 27, 2022, Morrison-Maierle structure engineers Rebecca Scheetz, PE, and Austin Batson, EI, performed a visual structural condition assessment of the Bozeman Swim Center structural systems, including the natatorium roof framing. The roof framing system over the natatorium consists of long span open-web wood scissor trusses that span the entirety of the room. Access to the natatorium framing was provided via a ladder to observe the visible portions of the bottom chords of the trusses along the east and west sections of pool deck in the natatorium. Lack of accessibility at the time of the initial assessment coupled with the presence of existing ceiling materials allowed for the observation of approximately 10% of the natatorium roof area.

During the initial assessment, mild checking was observed along the bottom chords of the trusses. Effects of moisture were also observed in the form of water staining and discoloration of the bottom chords, along with the rusting of nails and pins at several of the visible truss member connections. Given the critical nature of long span wood trusses in natatorium environments, particularly those located in areas with significant snow loading, it was our strong recommendation that the trusses undergo a more thorough visual assessment in which ceiling tiles are removed and full access from the pool deck be provided.

Based upon the observations and conclusions developed in the initial assessment, the decision was made to perform a follow-up assessment with increased access to observe a larger percentage of the natatorium roof framing. Morrison-Maierle structural engineers Rebecca Scheetz, PE, and Austin Batson, EI, were on site on Monday April 11, 2022 and Tuesday April 12, 2022 for this purpose. This report will outline our findings from this assessment.

## **STRUCTURAL ASSESSMENT OBJECTIVES**

The overall objective of this assessment to identify areas of structural concern and provide recommendations by which the City of Bozeman may manage and / or monitor these areas accordingly. We understand the objectives of this structural assessment to be as follows:

- 1) To conduct a follow-up visual condition assessment of the natatorium roof trusses and their connections.
- 2) To obtain photographs of the roof trusses and connections to document their current condition.
- 3) To use the information obtained to help the City of Bozeman manage and mitigate structural-related safety concerns with the roof and develop evaluation strategies for moving forward.

## **ON-SITE OBSERVATIONS AND IDENTIFICATIONS OF AREAS OF CONCERN**

Morrison-Maierle structural engineers Rebecca Scheetz, PE, and Austin Batson, EI, arrived on site at approximately 9:00AM on Monday April 11, 2022 to perform the first day of the two consecutive day follow up visual condition assessment of the natatorium roof trusses at the Swim Center. We met Max Ziegler of the City of Bozeman on site, who accompanied us through the duration the assessment.

A temporary rolling scaffolding system provided by the City of Bozeman was used to access the trusses from both sides of the pool deck. We selected two continuous lines of ceiling tiles (one on

each side of the pool deck) to remove to access the trusses to visually assess a limited portion of each end of each truss from both sides. We estimate that we were able to access and observe approximately 30% of the overall roof area; reference attached plan view S1 (Appendix A) for the approximate extent of the area observed.

All open-web roof trusses were given a numerical designation (1 to 48 beginning at the north wall). All areas of concern identified during the assessment were noted and photographed (Appendix B) and are shown schematically on sheet S1 (Appendix A) attached. Existing roof framing elements of structural concern noted during this follow-up visual condition assessment include the following:

- Open-web roof trusses number 8, 11, 12, 17, 18, 19, 20, 27, 30, 31, 34, 35, 36, 38, 42, and 43 showed deep checks / splits in the 2x6 bottom chord members (Fig 1-2).
- Open-web roof trusses number 31, 40, and 44 showed deep checks / splits in the 2x6 top chord members.
- Open-web roof trusses number 14 and 16 showed moderate checking in the 2x6 bottom chord members.
- Nearly every 2x6 top and bottom chord member showed mild checking.
- Nearly every 2x6 top and bottom chord member showed evidence of moisture damage and discoloration (Fig 3).
- Heavy rusting was observed at the uncoated steel connection bolts and hardware, including the center tie-plate connections and panel-point pins in several locations throughout (Fig 4).
- The westernmost CMU wall of the natatorium appears to be out of plumb by approximately one-half inch over four feet. The CMU walls also appear to be separating from each other at both the northwest and southwest corners of the building (Fig 5-6).



*Figure 1: Splitting in bottom chord – truss 11*



*Figure 2: Splitting in bottom chord – truss 27*



*Figure 3: Typical moisture damage / discoloration observed multiple locations throughout*



*Figure 4: Typical rusting observed at panel-point pins*



*Figure 5: Typical wall separation at northwest and southwest corners of natatorium*



*Figure 6: Westernmost CMU wall is out of plumb at approximately one-half inch over four feet*

## **CONCLUSIONS AND RECOMMENDATIONS**

Within the limited extents of the 48 trusses visually observed, at least 18 trusses showed deep checking / splitting in the 2x6 bottom and / or top chord members. Mild to moderate checking, rust, and moisture damage / discoloration were also observed throughout. Given the critical nature, magnitude, and widespread distribution of structural concerns discovered during our limited visual structural assessment, it is our opinion that this roof's structural adequacy is compromised at this time.

There is a strong likelihood that roof snow loading has been a contributing factor in causing the above-mentioned concerns. However, because the roof trusses in question were not observed while subjected to significant snow loading, we cannot directly conclude to what extent roof snow loads have contributed to the current condition of the trusses. We also cannot quantify whether or to what extent the checking / splitting observed in the truss members has been influenced by the regular cycles of wetting and drying in the pool environment. If a more detailed investigation and assessment of the severity and cause of the moisture related checking / splitting in the top and bottom wood chords is desired, we recommend that an expert in the area of wood damage / deterioration forensics be engaged.

It is our opinion that the humid pool environment coupled with an apparent lack of adequate ventilation was most likely a contributing factor to the apparent moisture-related issues, including moisture damage / discoloration of the 2x6 top and bottom chords and rusting at the uncoated steel connection bolts and hardware, including the center tie-plate connections and several panel-point pins. The severity of these issues appeared to range from mild to moderate. If a more detailed investigation and assessment of the severity and cause of the moisture related damage to the wooden 2x6 top and bottom chords is desired, we recommend that an expert in the area of wood damage / deterioration forensics be engaged.

We also believe the westernmost wall deflecting out-of-plumb has impacted the current condition of the trusses. The movement of this wall, likely caused by sustained heavy snow loads on the trusses and a lack of adequate wall bracing, is likely causing permanent increased stresses in the truss top and bottom chord members. It is unlikely that the trusses were designed for these increased stresses. This theory is supported by our observation of increased checking / splitting present on the western end of the trusses. However, we cannot quantify with certainty whether or to what extent the deflection of the westernmost wall has contributed to the current condition of the trusses.

Based on these findings, we recommend that the City of Bozeman consider the following:

- 1.) Moving forward, there are at least two potential options for restoring the natatorium roof framing system as follows:
  - A. The structural roof system may be demolished and replaced in its entirety by a new structural roof system with framing and connections designed to resist both gravity and lateral loads calculated in accordance with the current governing building codes. Other systems, including but not limited to the HVAC systems and building envelope, will also need to be considered if this option is selected.
  - B. The trusses may be further investigated to determine if they may be repaired. While we did not observe any items while on site that would prevent this from being a viable option, it is our strong recommendation that the trusses undergo a more thorough visual assessment in which the ceiling tiles are removed and full access from the pool deck is provided. This will allow for the identification of all areas of structural concern and for the assessment of each for its potential for repair. It is also our recommendation that the City engage an expert in the area of wood damage / deterioration forensics to provide a more detailed investigation and assessment of the severity and cause of the wood deterioration (including moisture damage, checks, splits, etc.), as well as to further advise on the feasibility of this option. This option, if determined feasible based on the further assessment of the trusses as noted, would require the design and construction of the structural repairs / modifications to the existing compromised members and connections

necessary to resist both gravity and lateral loads calculated in accordance with the current governing building codes. This option may include, but is not limited to, sistering new 2x framing to the existing 2x top and bottom chords in all areas of structural concern, replacing rusted hardware, sealing the roof framing and connections, properly ventilating the ceiling space, and verifying that positive connections exist at the truss bearing locations (and providing positive connections in these locations if not).

As mentioned, options A and B are only two options for the City of Bozeman's consideration regarding the restoration of the natatorium roof framing system. There may be other viable options worth considering.

- 2.) We recommend initiating the analysis, design and construction of structural repairs / modifications of the existing westernmost CMU wall as necessary.

### **LIMITATIONS**

*Our discussions and opinions expressed verbally and in the summary information above does not express nor imply any warranty or guarantee of the existing conditions and is limited to the directed areas of focus and structural elements that were observable at the time of these efforts. There is no claim, neither stated nor implied, that all faulty conditions were or could be determined based on the limited scope of our efforts.*

Please do not hesitate to contact us with any questions or concerns you may have.

Morrison-Maierle, Inc.



Jay Fischer, PE



Rebecca Scheetz, PE



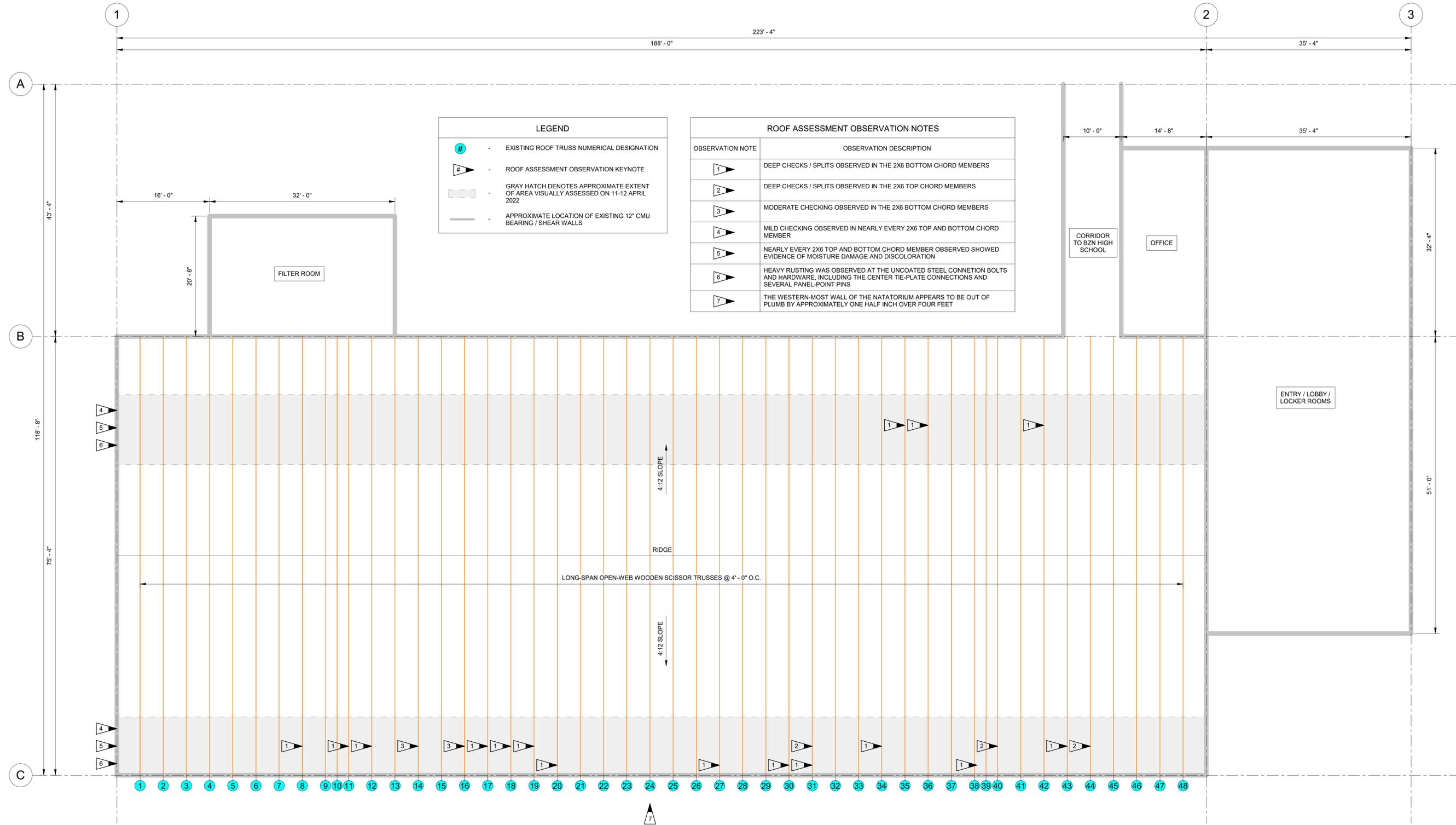
Austin Batson, EI

### **Attachments:**

*Appendix A:* Sheet S1: Swim Center Natatorium Roof Framing Plan (1 page)

*Appendix B:* Swim Center Natatorium Roof Framing Photos (6 pages)

*Appendix C:* Swim Center Original Construction Documents from 1974 (29 pages)



**LEGEND**

- # - EXISTING ROOF TRUSS NUMERICAL DESIGNATION
- # - ROOF ASSESSMENT OBSERVATION KEYNOTE
- ▨ - GRAY HATCH DENOTES APPROXIMATE EXTENT OF AREA VISUALLY ASSESSED ON 11-12 APRIL 2022
- - APPROXIMATE LOCATION OF EXISTING 12" CMU BEARING / SHEAR WALLS

**ROOF ASSESSMENT OBSERVATION NOTES**

OBSERVATION NOTE	OBSERVATION DESCRIPTION
1	DEEP CHECKS / SPLITS OBSERVED IN THE 2X6 BOTTOM CHORD MEMBERS
2	DEEP CHECKS / SPLITS OBSERVED IN THE 2X6 TOP CHORD MEMBERS
3	MODERATE CHECKING OBSERVED IN THE 2X6 BOTTOM CHORD MEMBERS
4	MILD CHECKING OBSERVED IN NEARLY EVERY 2X6 TOP AND BOTTOM CHORD MEMBER
5	NEARLY EVERY 2X6 TOP AND BOTTOM CHORD MEMBER OBSERVED SHOWED EVIDENCE OF MOISTURE DAMAGE AND DISCOLORATION
6	HEAVY RUSTING WAS OBSERVED AT THE UNCOATED STEEL CONNECTION BOLTS AND HARDWARE, INCLUDING THE CENTER TIE-PLATE CONNECTIONS AND SEVERAL PANEL-POINT PINS
7	THE WESTERN-MOST WALL OF THE NATATORIUM APPEARS TO BE OUT OF PLUMB BY APPROXIMATELY ONE HALF INCH OVER FOUR FEET

1 SWIM CENTER NATATORIUM ROOF FRAMING PLAN  
NTS

VISUAL CONDITION ASSESSMENT: 11-12 APRIL 2022

N:\0417091 - Lindley and Swin Assessments\Winter 22\SwimFollowUp Truss Assessment & Tier 1 Swin\Revised\Swim Center Roof Plan.rvt

VERIFY SCALE!  
THESE PRINTS MAY BE REDUCED. LINE BELOW MEASURES ONE INCH ON ORIGINAL DRAWING.  
MODIFY SCALE ACCORDINGLY!  
PLOTTED ON: 05/10/2022 08:47:14

NO.	DESCRIPTION	DATE	BY



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Bend, OR 97702  
541.699.5432  
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**DRAFT**

DRAWN BY: RLS  
DSGN. BY: \_\_\_\_\_  
APPR. BY: \_\_\_\_\_  
DATE: MAY 2020  
Q.C. REVIEW BY: \_\_\_\_\_  
DATE: \_\_\_\_\_

BOZEMAN  
CITY OF BOZEMAN SWIM CENTER NATATORIUM ROOF ASSESSMENT  
MONTANA  
NATATORIUM ROOF PLAN

PROJECT NUMBER 0417.091  
SHEET NUMBER 1 OF 1  
DRAWING NUMBER S1

**APPENDIX B: Swim Center Natatorium Roof Truss Visual Assessment Photos**



*Moisture damage / discoloration observed in top chord and wood deck*



*End wall condition at northern wall*



*Deep checking continuous through glued splice in bottom chord  
– truss 35*



*Typical moisture damage / discoloration observed multiple locations  
throughout*



*Typical bearing wall connection obstructed from view by spray insulation*



*Deep checking in bottom chord – truss 8*



*Splitting in bottom chord – truss 11*



*Mild checking in top chord observed throughout*



*Moderate checking in bottom chord – truss 17*



*Splitting in bottom chord – truss 20*



*Cracking in westernmost CMU bearing wall observed throughout*



*Mild checking in bottom chord observed throughout*



*Mild checking in bottom chord observed throughout*



*Typical rusting observed at panel-point pins*



*Typical rusting observed at panel-point pins*



*Splitting in bottom chord – truss 27*



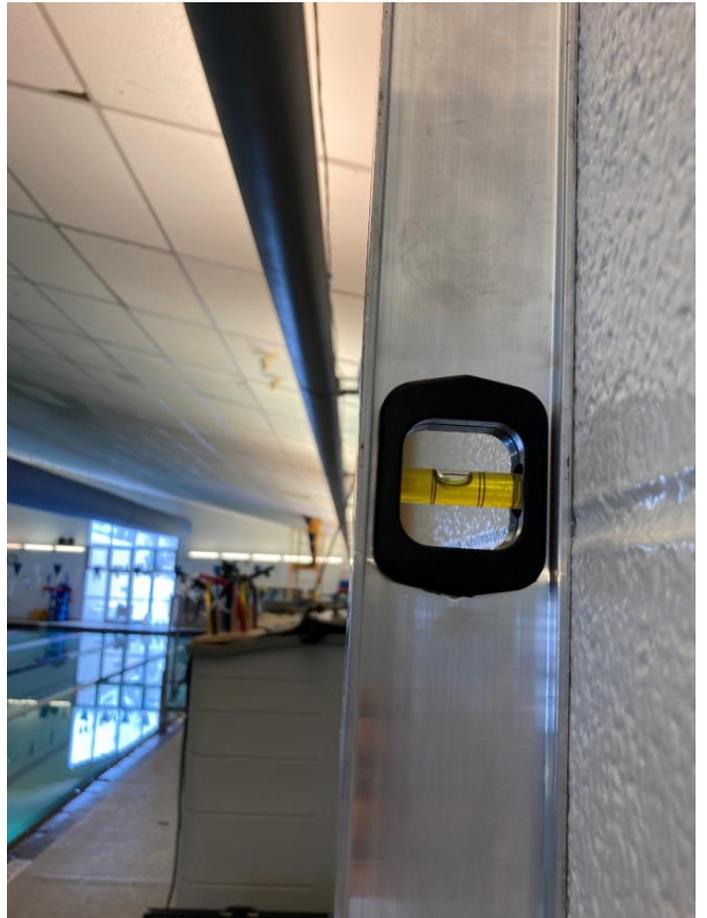
*Deep checking in bottom chord – truss 30*



*Bottom chord bracing connection to south end wall*



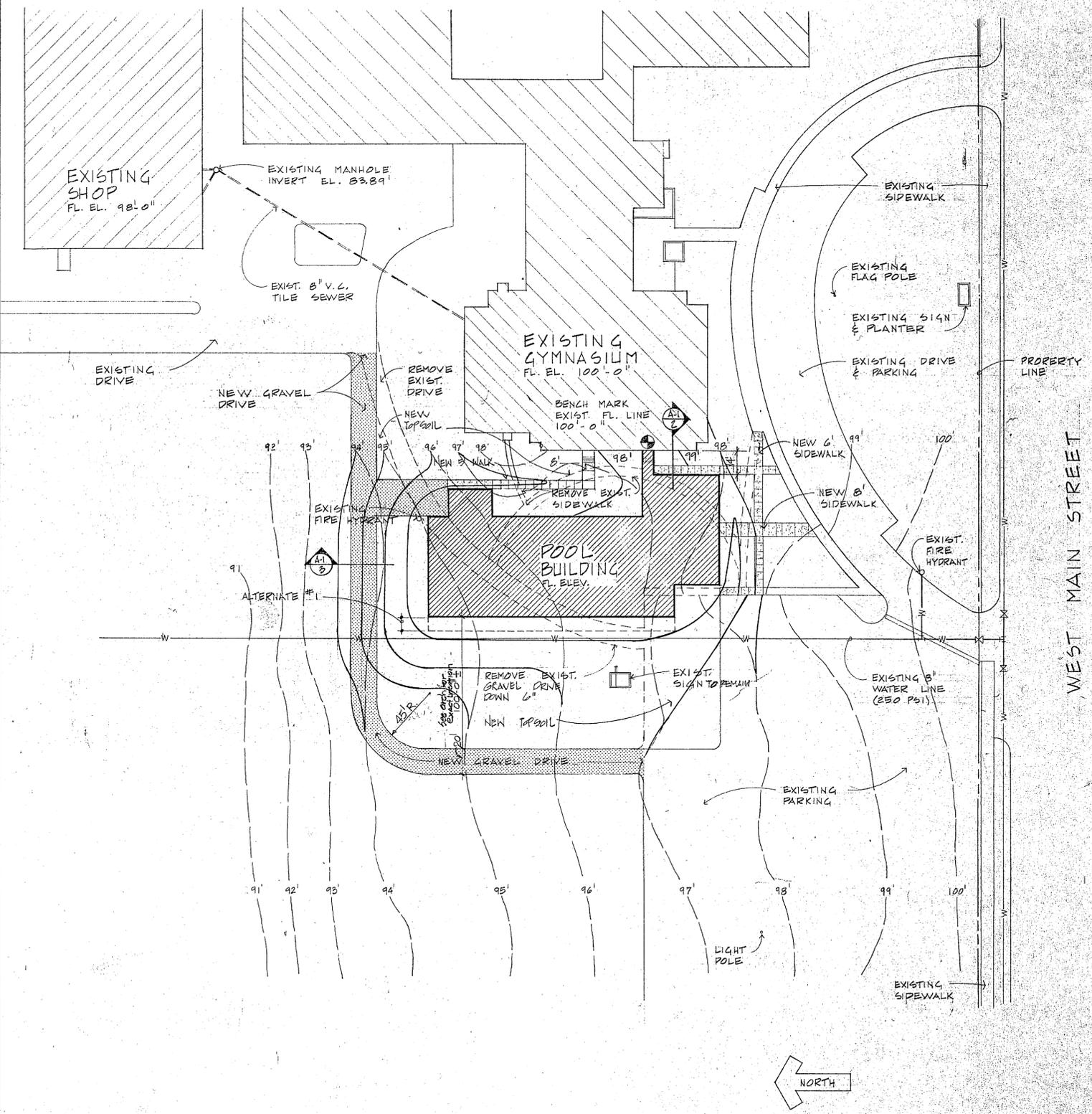
*End wall condition at southern wall*



*Westernmost CMU wall is out of plumb at approximately one-half inch over four feet*

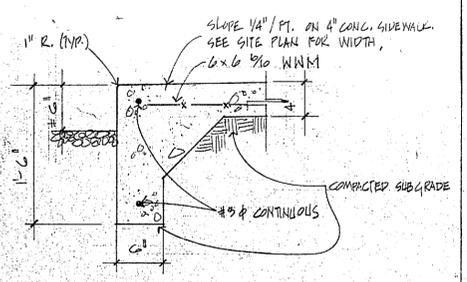


*Typical wall separation at northwest and southwest corners of natatorium*

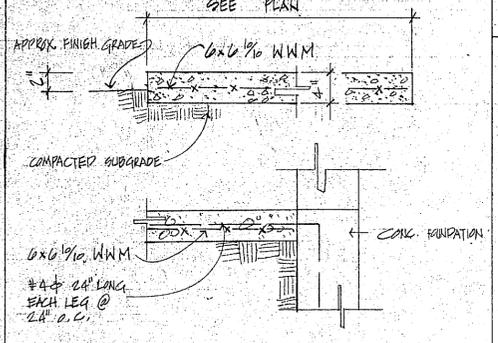


SITE PLAN

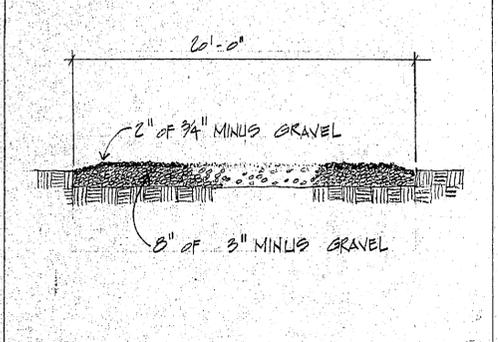
1" = 50'-0"



1 CURB DETAIL 1" = 1'-0"



2 SIDEWALK DETAIL 1" = 1'-0"



3 ROAD CROSS SECTION

	EARTH		GYPSUM BOARD
	GRAVEL		INSULATION
	CONCRETE		ACOUSTICAL TILE
	CONCRETE BLOCK		METAL
	EXISTING MASONRY		GROUT
	DIMENSION LUMBER		
	FINISHED WOOD		
	PLYWOOD		

MATERIAL LEGEND

ARCHITECTURAL DRAWINGS

- A-1 SITE PLAN - LEGEND
- A-2 FLOOR PLAN - BASE BID
- A-3 FLOOR PLAN - ALTERNATE No.1
- A-4 DOOR, HARDWARE, ROOM FINISH SCHEDULES
- A-5 EXTERIOR ELEVATIONS
- A-6 EXTERIOR ELEVATIONS - DETAILS
- A-7 BUILDING SECTIONS
- A-8 WALL SECTIONS - DETAILS
- A-9 WALL SECTIONS - DETAILS
- A-10 MILLWORK - DETAILS - SECTIONS
- A-11 INTERIOR ELEVATIONS
- A-12 REFLECTED CEILING PLAN

STRUCTURAL DRAWINGS

- S-1 FOUNDATION PLAN - BASE BID
- S-2 ROOF PLAN - BASE BID
- S-3 SECTIONS
- S-4 SECTIONS, DETAILS, NOTES
- S-5 FOUNDATION - ROOF FRAMING PLAN - ALTERNATE #1

MECHANICAL DRAWINGS

- ME-1 MECHANICAL - ELECTRICAL SITE PLAN
- M-1 PLUMBING PLAN - BASE BID
- M-2 PLUMBING PLAN - ALTERNATE #1
- M-3 HEATING - VENTILATING BASE BID - DETAILS
- M-4 HEATING - VENTILATING ALTERNATE #1

ELECTRICAL DRAWINGS ALSO SEE ME-1

- E-1 LIGHTING PLAN - BASE BID
- E-2 POWER PLAN - BASE BID
- E-3 LIGHTING - POWER PLAN - ALTERNATE #1

SWIMMING POOL PLANS

- SP-1 SWIMMING POOL PLAN
- SP-2 SWIMMING POOL DETAILS
- SP-3 SWIMMING POOL PIPING PLAN
- SP-4 SWIMMING POOL EQUIPMENT
- SP-5 SWIMMING POOL DETAILS - SECTIONS



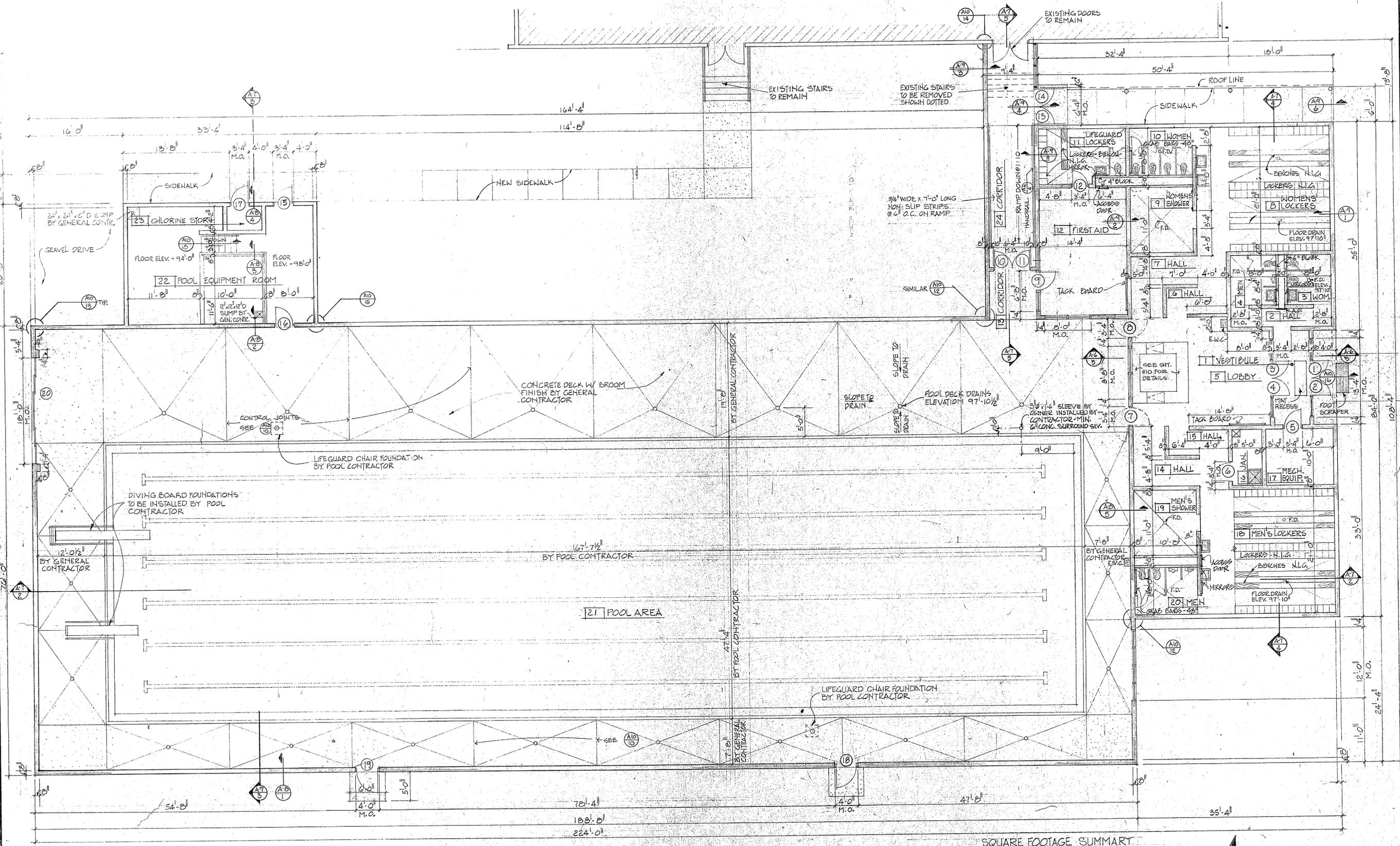
ENGINEER  
 O. Berg, Jr., No. 200  
 W.E. Grabow - 300  
 W.A. Schaefer - 199  
 STATE OF MONTANA  
 LICENSED PROFESSIONAL ARCHITECTS

OWNER CITY OF BOZEMAN, MONTANA  
 PROJECT BOZEMAN MUNICIPAL POOL  
 SHEET SITE PLAN - LEGEND

**BERG - GRABOW & PARTNERS**  
 ARCHITECTS-ENGINEERS-PLANNING CONSULTANTS  
 bozeman montana

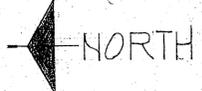
JOB NO. 7407  
 DEC. 1974  
**A-1**  
 OF 12

EXISTING SENIOR HIGH SCHOOL



SQUARE FOOTAGE SUMMARY

SWIMMING POOL	14,884 S.F.
POOL EQUIPMENT	686 S.F.
LOCKER ROOMS	3,833 S.F.
TOTAL	19,403 S.F.



1/8" = 1'-0"

NOTE - SEE SHEET A-11 FOR INTERIOR ELEVATIONS

① FLOOR PLAN - BASE BID

STATE OF MONTANA  
O. Berg, Jr. - 206  
W.E. Grabow - 300  
P.A. Schaefer - 196  
BOZEMAN, MONTANA  
LICENSED PROFESSIONAL ARCHITECTS

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ENGINEER

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OWNER CITY OF BOZEMAN, MONTANA

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PROJECT BOZEMAN MUNICIPAL POOL

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SHEET FLOOR PLAN - BASE BID

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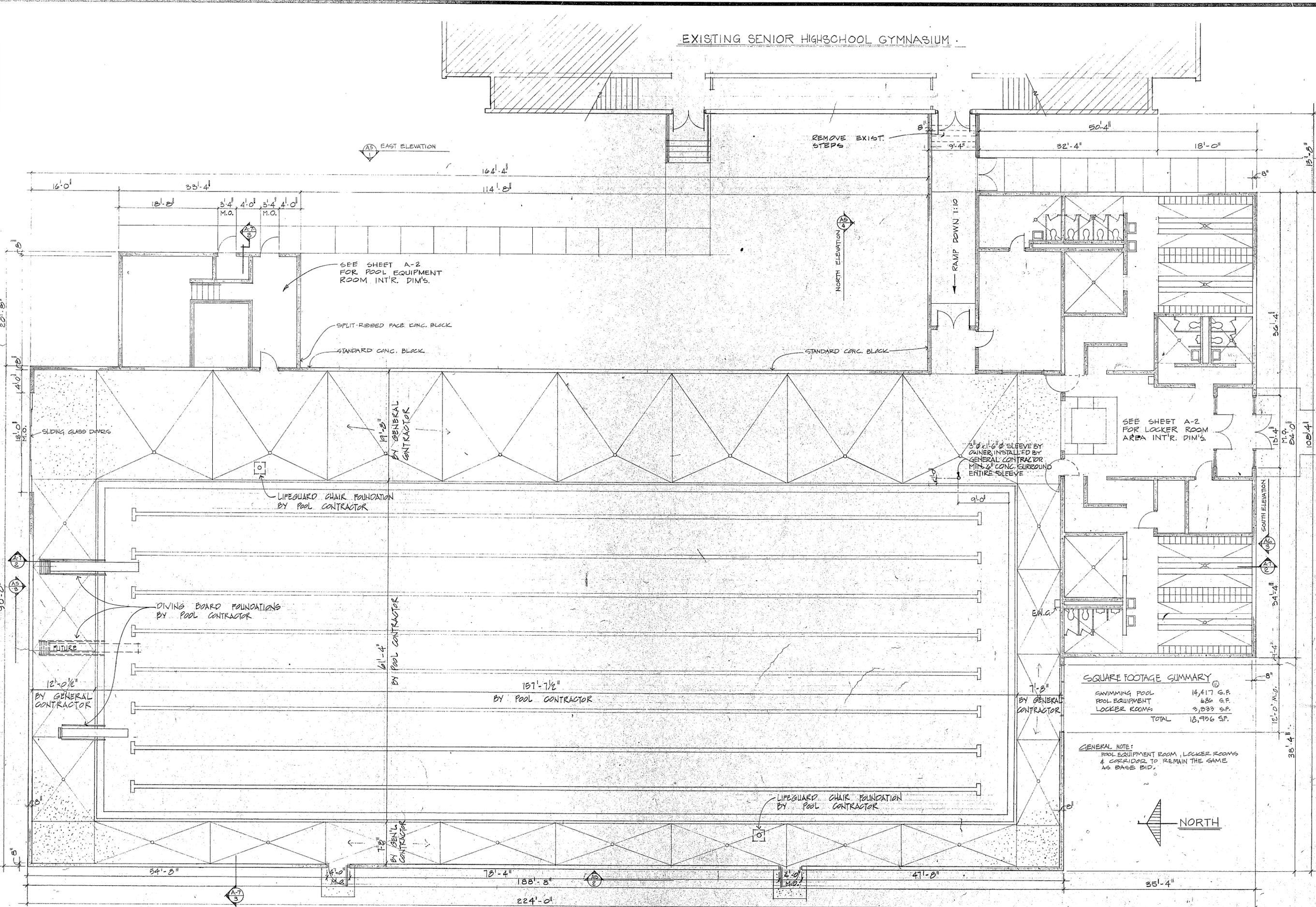
**BERG-GRABOW & PARTNERS**  
ARCHITECTS-ENGINEERS-PLANNING CONSULTANTS  
bozeman montana

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JOB NO. 7407  
DEC. 1974

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A-2  
of 12



EXISTING SENIOR HIGH SCHOOL GYMNASIUM

AS EAST ELEVATION

NORTH ELEVATION

RAMP DOWN 1:10

EN.G.

SOUTH ELEVATION

NORTH

SEE SHEET A-2 FOR POOL EQUIPMENT ROOM INT'R. DIM'S.

SEE SHEET A-2 FOR LOCKER ROOM AREA INT'R. DIM'S.

SQUARE FOOTAGE SUMMARY

SWIMMING POOL	14,417 S.F.
POOL EQUIPMENT	680 S.F.
LOCKER ROOMS	3,833 S.F.
TOTAL	18,930 S.F.

GENERAL NOTE:  
POOL EQUIPMENT ROOM, LOCKER ROOMS & CORRIDOR TO REMAIN THE SAME AS BASE BID.

ALTERNATE NO. 1 - FLOOR PLAN 1/8" = 1'-0"

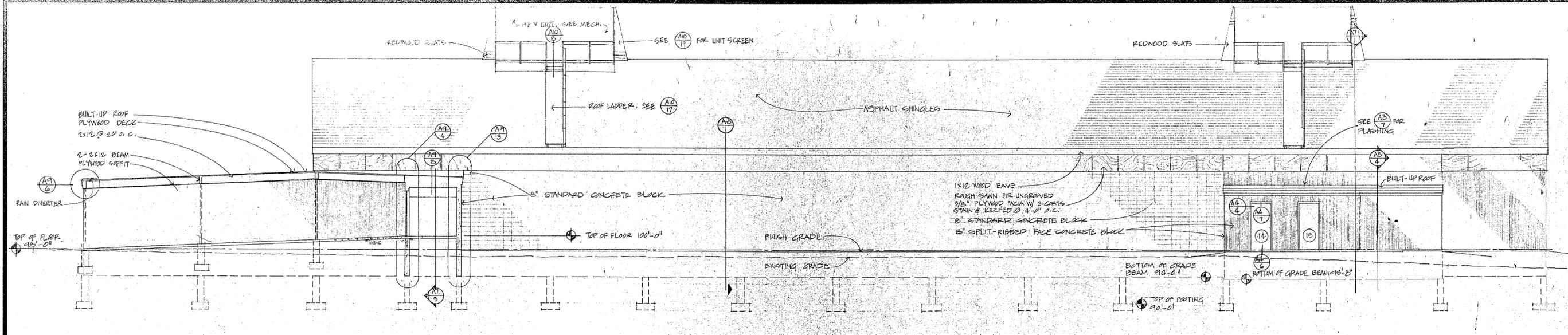


ENGINEER  
DRAWING MAY BE REPRODUCED OR COPIED IN WHOLE OR IN PART FOR ANY PURPOSE PROVIDED THAT THE ORIGINAL SOURCE IS ACKNOWLEDGED AND THE FOLLOWING INFORMATION IS CONTAINED THEREIN:  
SHEET NUMBER  
DETAIL NUMBER  
DETAIL KEY

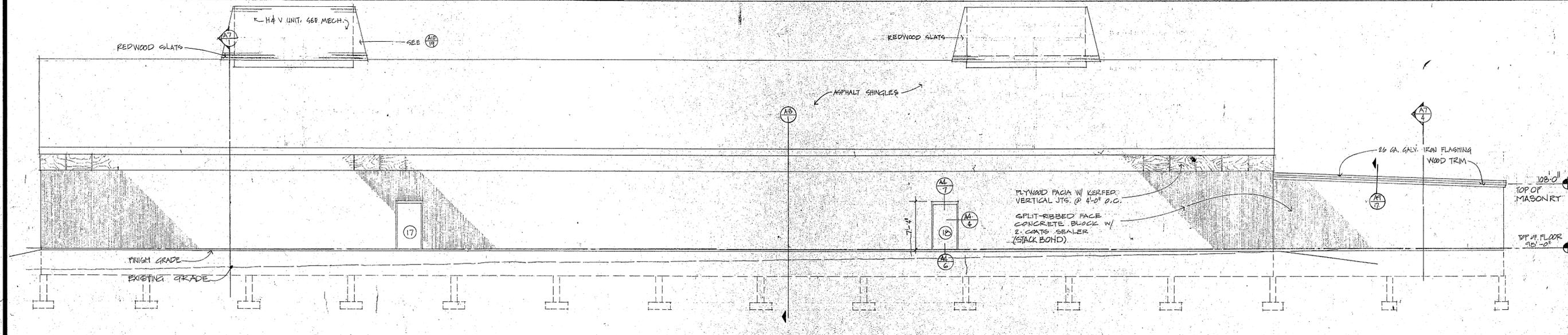
OWNER CITY OF BOZEMAN, MONTANA  
PROJECT BOZEMAN MUNICIPAL POOL  
SHEET FLOOR PLAN - ALTERNATE NO. 1

**BERG-GRABOW & PARTNERS**  
ARCHITECTS-ENGINEERS-PLANNING CONSULTANTS  
bozeman montana

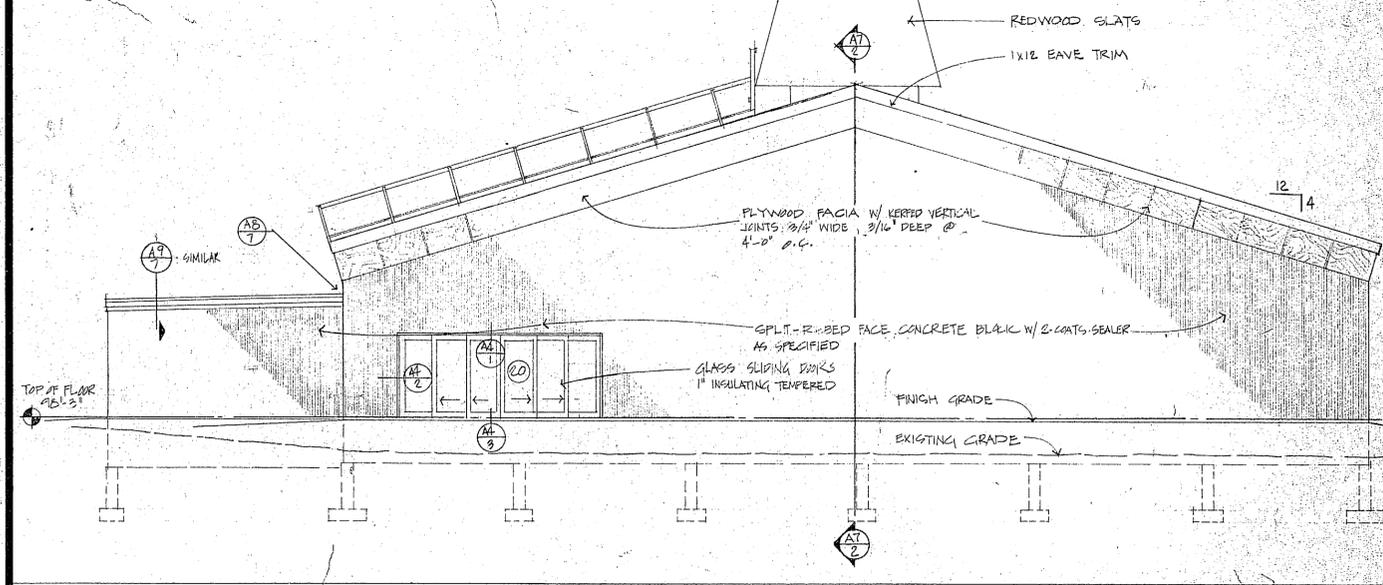




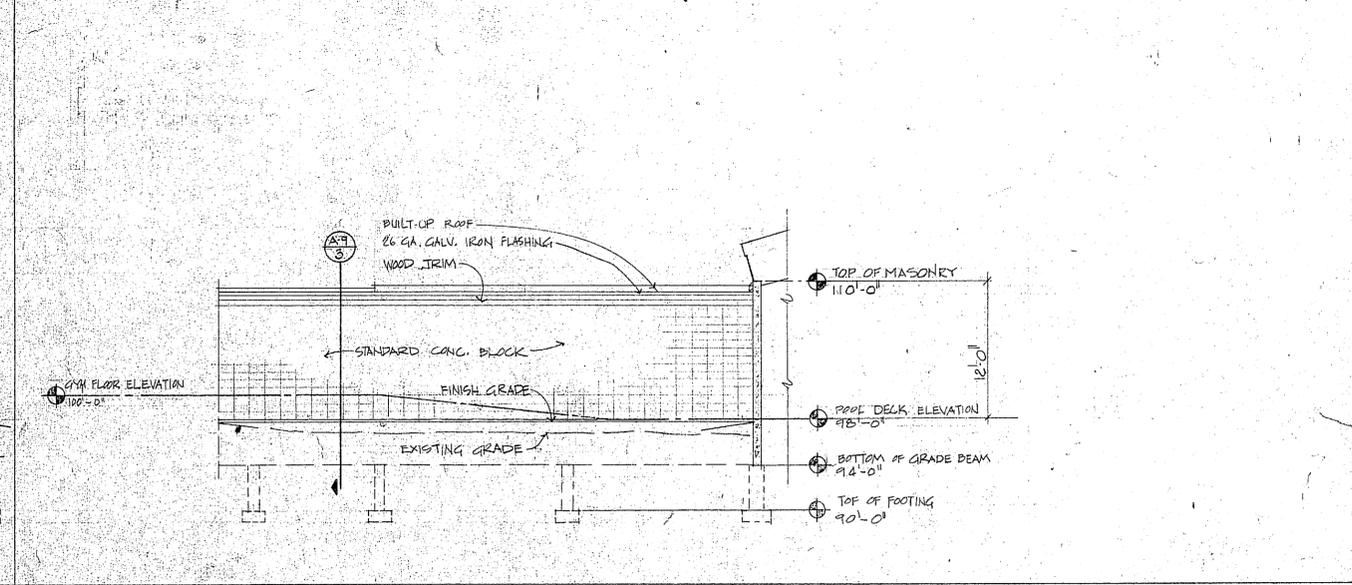
① EAST ELEVATION - ALTERNATE #1 & BASE BID 1/8" = 1'-0"



② WEST ELEVATION - ALTERNATE #1 & BASE BID 1/8" = 1'-0"



③ NORTH ELEVATION - ALTERNATE #1 1/8" = 1'-0"

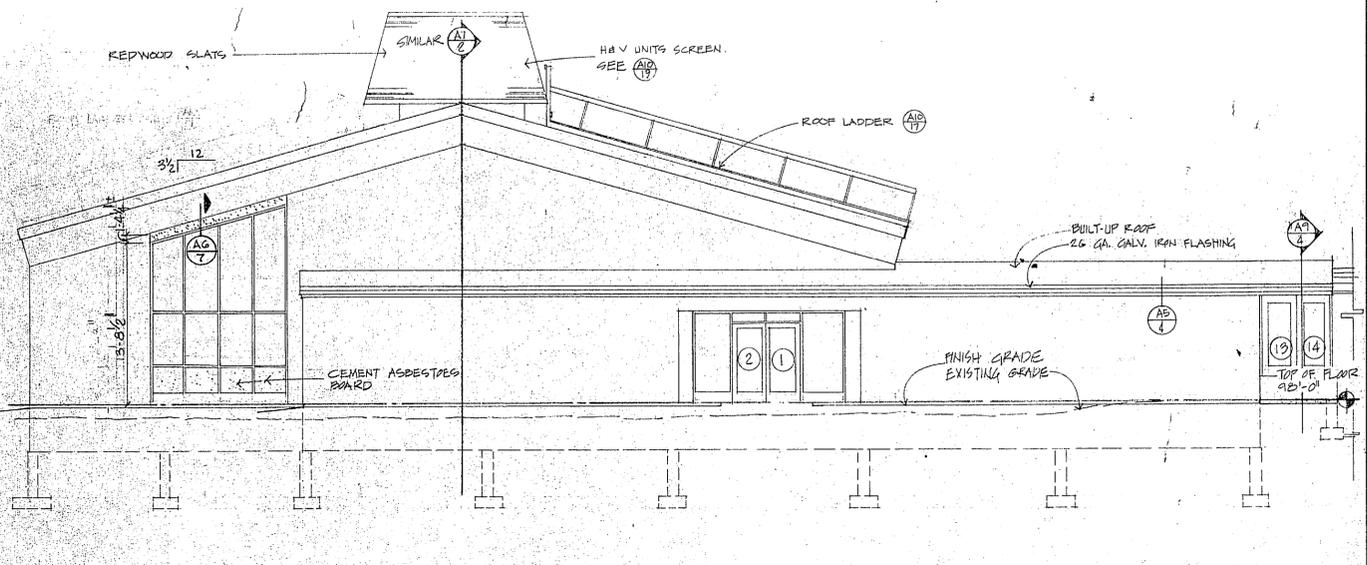
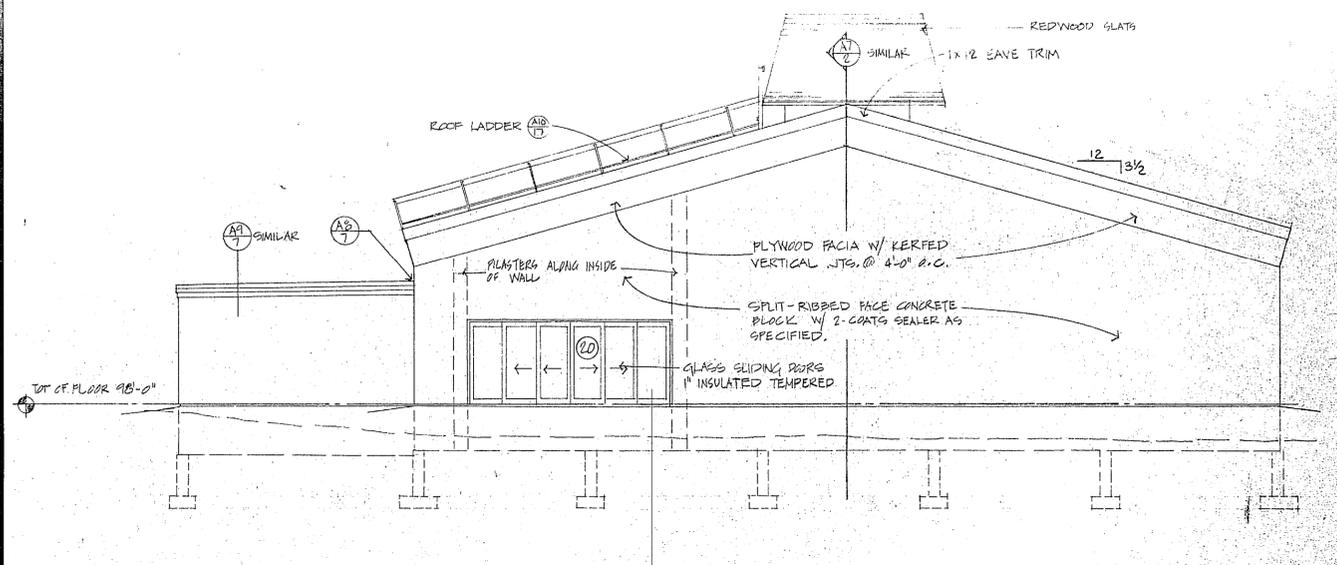


④ NORTH ELEVATION OF CORRIDOR #24 1/8" = 1'-0"

ENGINEER  
 CITY OF BOZEMAN, MONTANA  
 PROJECT BOZEMAN MUNICIPAL POOL  
 SHEET EXTERIOR ELEVATIONS

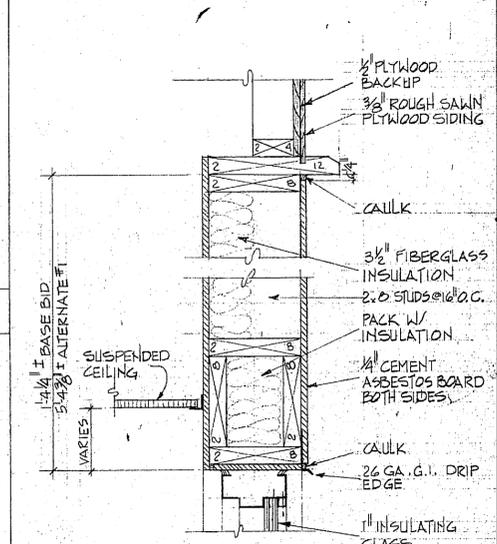
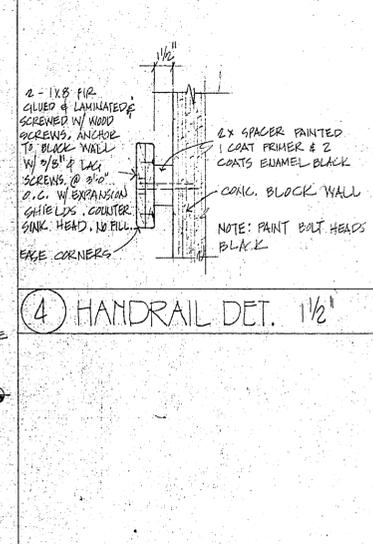
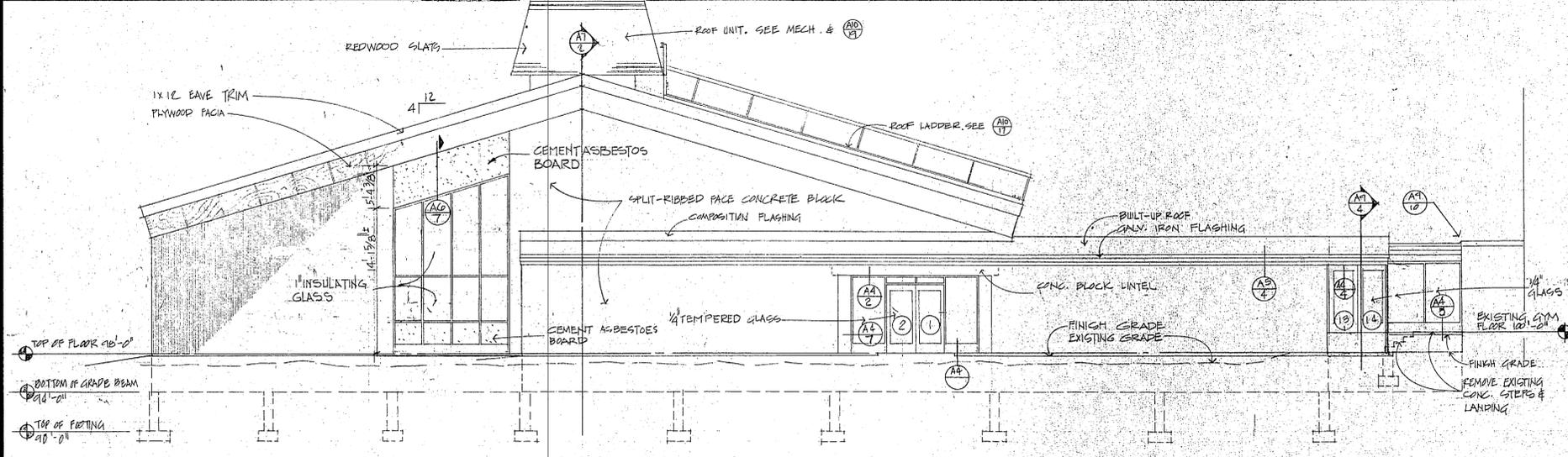
OWNER  
 PROJECT  
 SHEET

**BERG-GRABOW & PARTNERS**  
 ARCHITECTS-ENGINEERS-PLANNING CONSULTANTS  
 bozeman montana



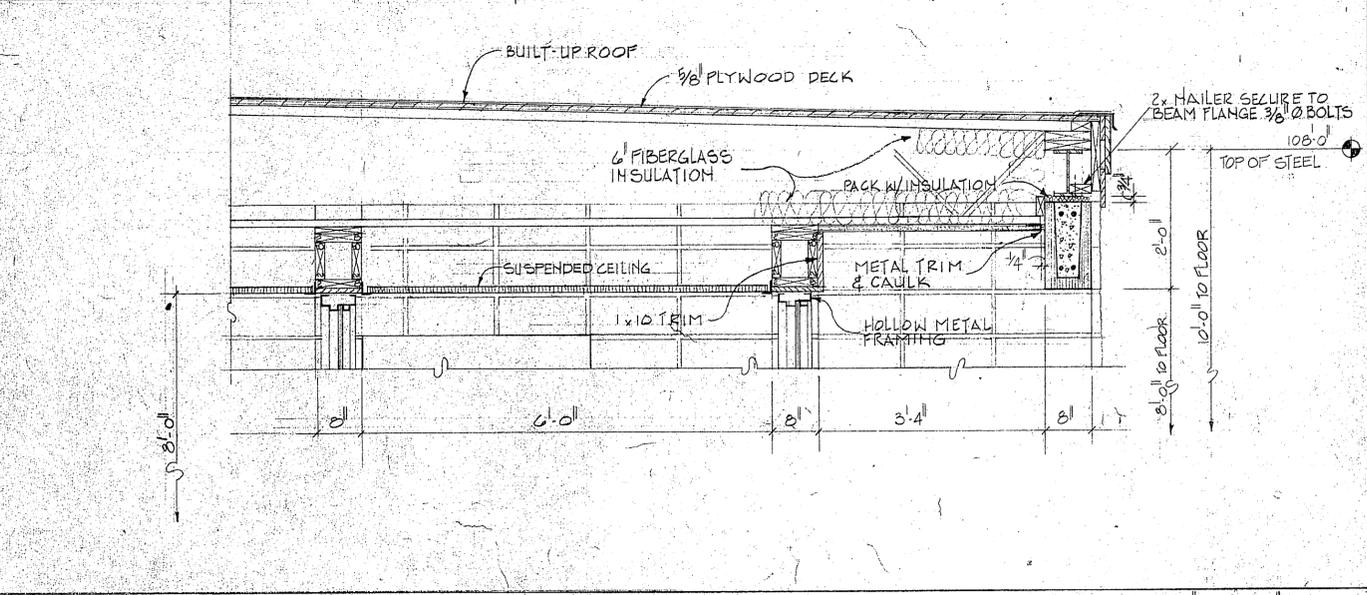
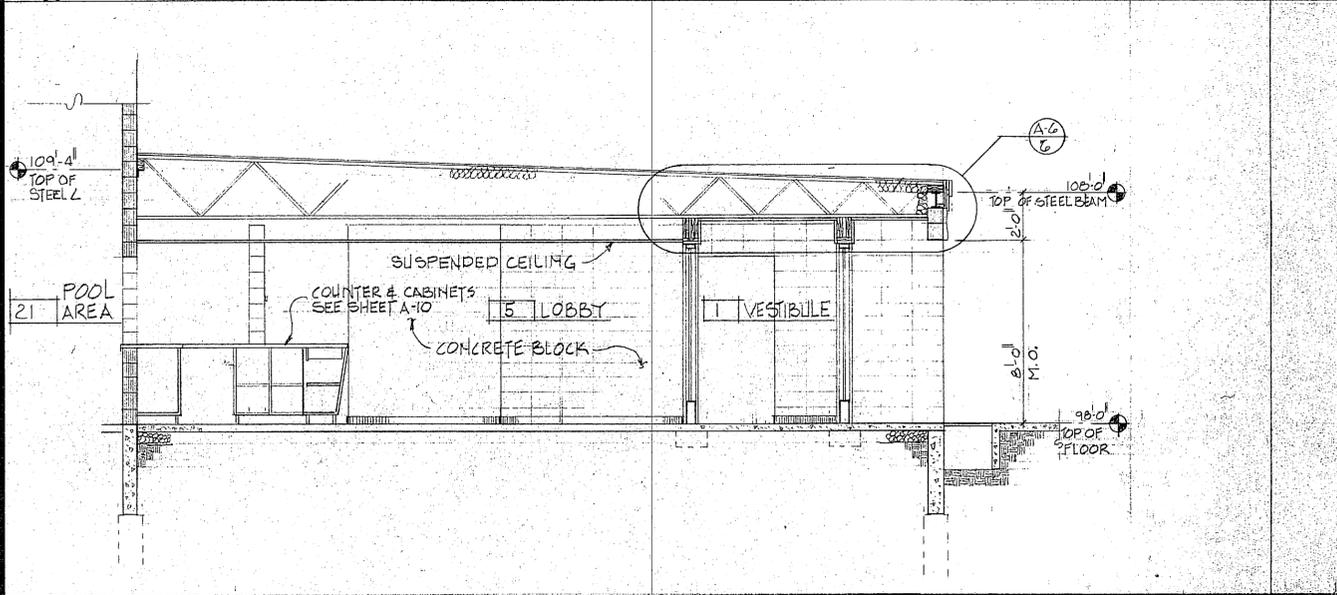
① NORTH ELEVATION - BASE BID  $1/8" = 1'-0"$

② SOUTH ELEVATION - BASE BID  $1/8" = 1'-0"$



③ SOUTH ELEVATION - ALTERNATE 1  $1/8" = 1'-0"$

⑦ WALL DETAIL  $1/2" = 1'-0"$



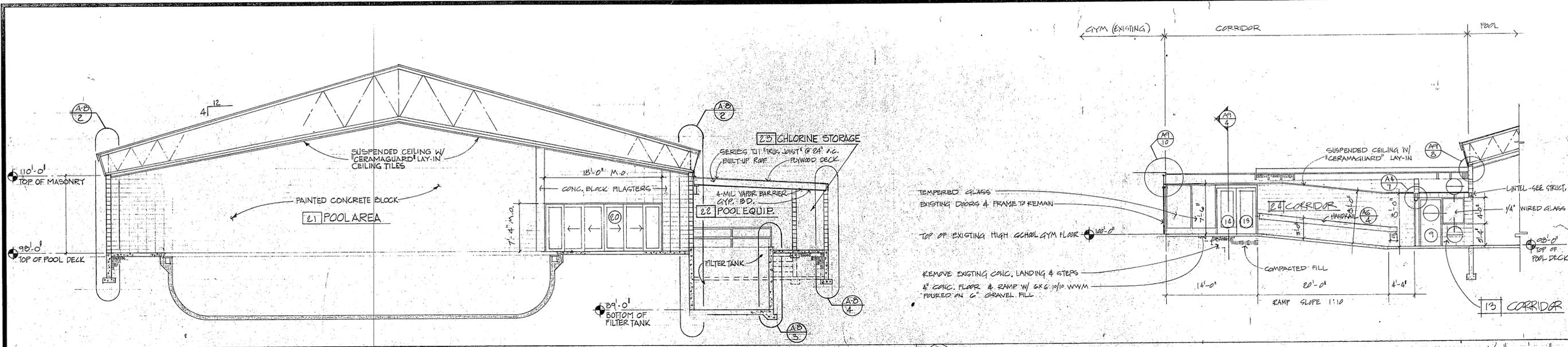
⑤ PARTIAL BUILDING SECTION @ MAIN ENTRANCE  $1/4" = 1'-0"$

⑥ SECTION @ MAIN ENTRANCE DOOR HEADS  $3/4" = 1'-0"$

ENGINEER  
 SHEET NUMBER  
 DRAWING NUMBER  
 DETAIL KEY

OWNER  
 CITY OF BOZEMAN, MONTANA  
 PROJECT  
 BOZEMAN MUNICIPAL POOL  
 SHEET  
 EXTERIOR ELEVATIONS - DETAILS

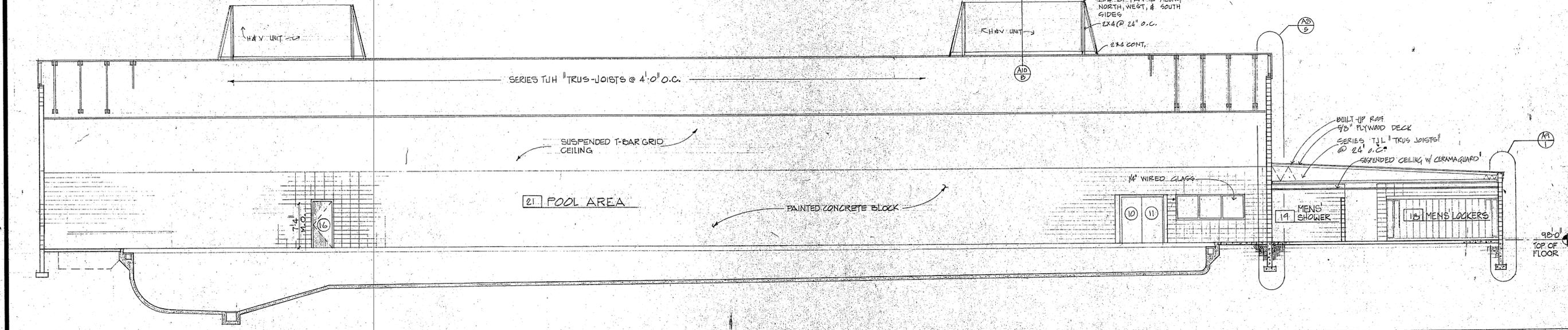
BERG-GRAW & PARTNERS  
 ARCHITECTS-ENGINEERS-PLANNING CONSULTANTS  
 bozeman montana



(1) BUILDING SECTION - ALTERNATE #1

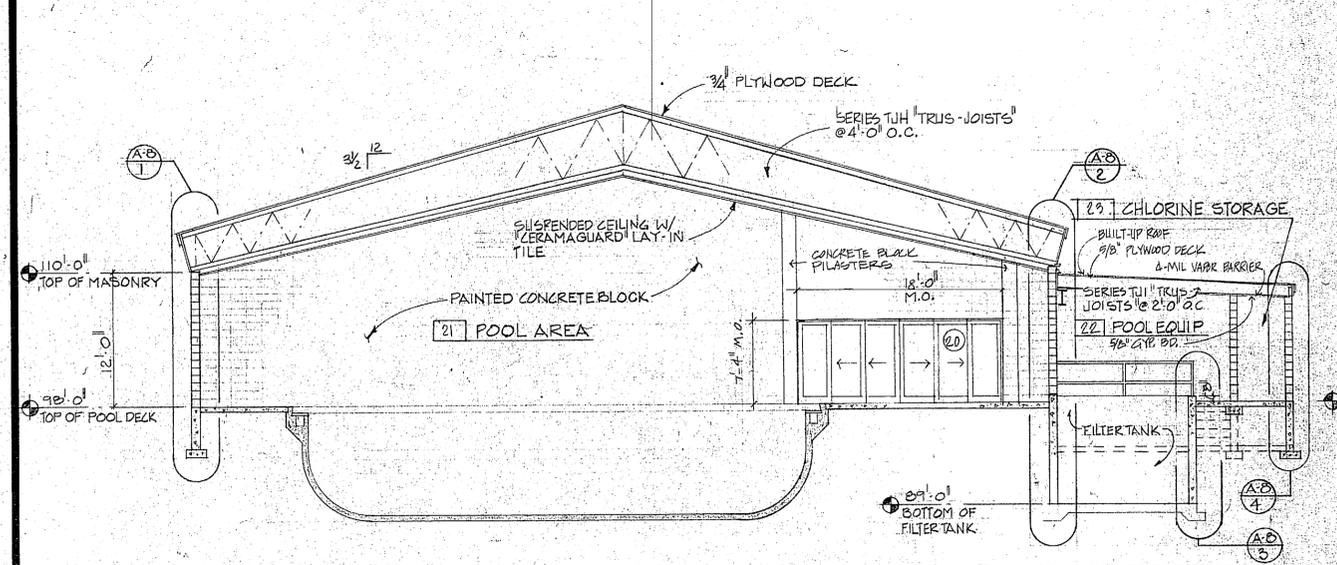
(5) CORRIDOR SECTION

1/8" = 1'-0"



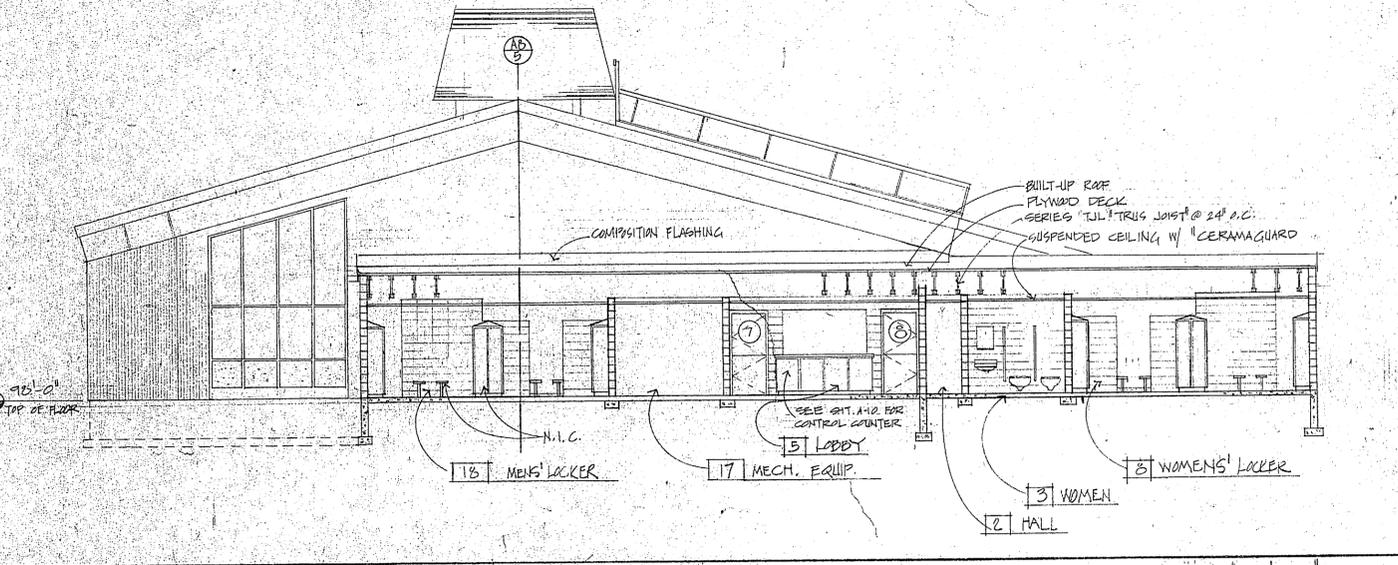
(2) LONGITUDINAL BUILDING SECTION

1/8" = 1'-0"



(3) BUILDING SECTION - BASE BID

1/8" = 1'-0"



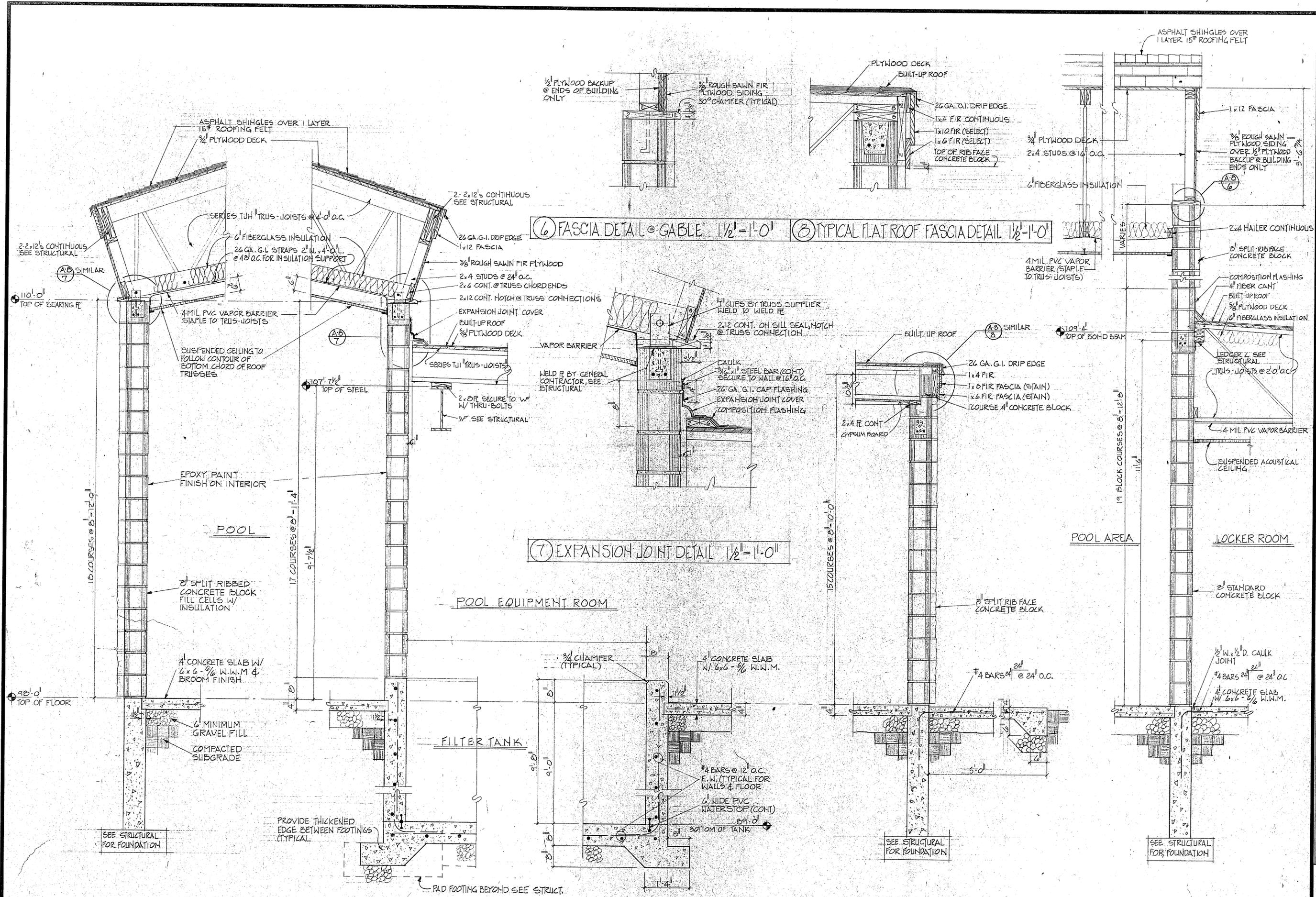
(4) BUILDING SECTION THRU LOCKER ROOMS

1/8" = 1'-0"

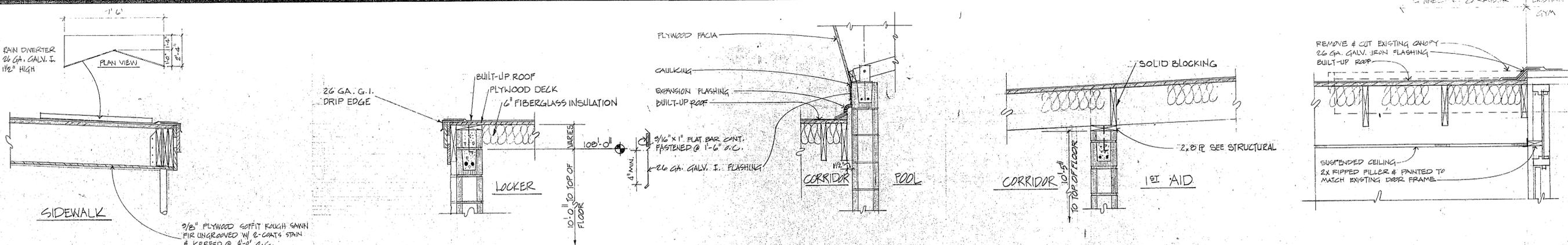
ENGINEER  
 CITY OF BOZEMAN, MONTANA  
 PROJECT  
 BOZEMAN MUNICIPAL POOL  
 SHEET  
 BUILDING SECTIONS

OWNER  
 CITY OF BOZEMAN, MONTANA  
 PROJECT  
 BOZEMAN MUNICIPAL POOL  
 SHEET  
 BUILDING SECTIONS

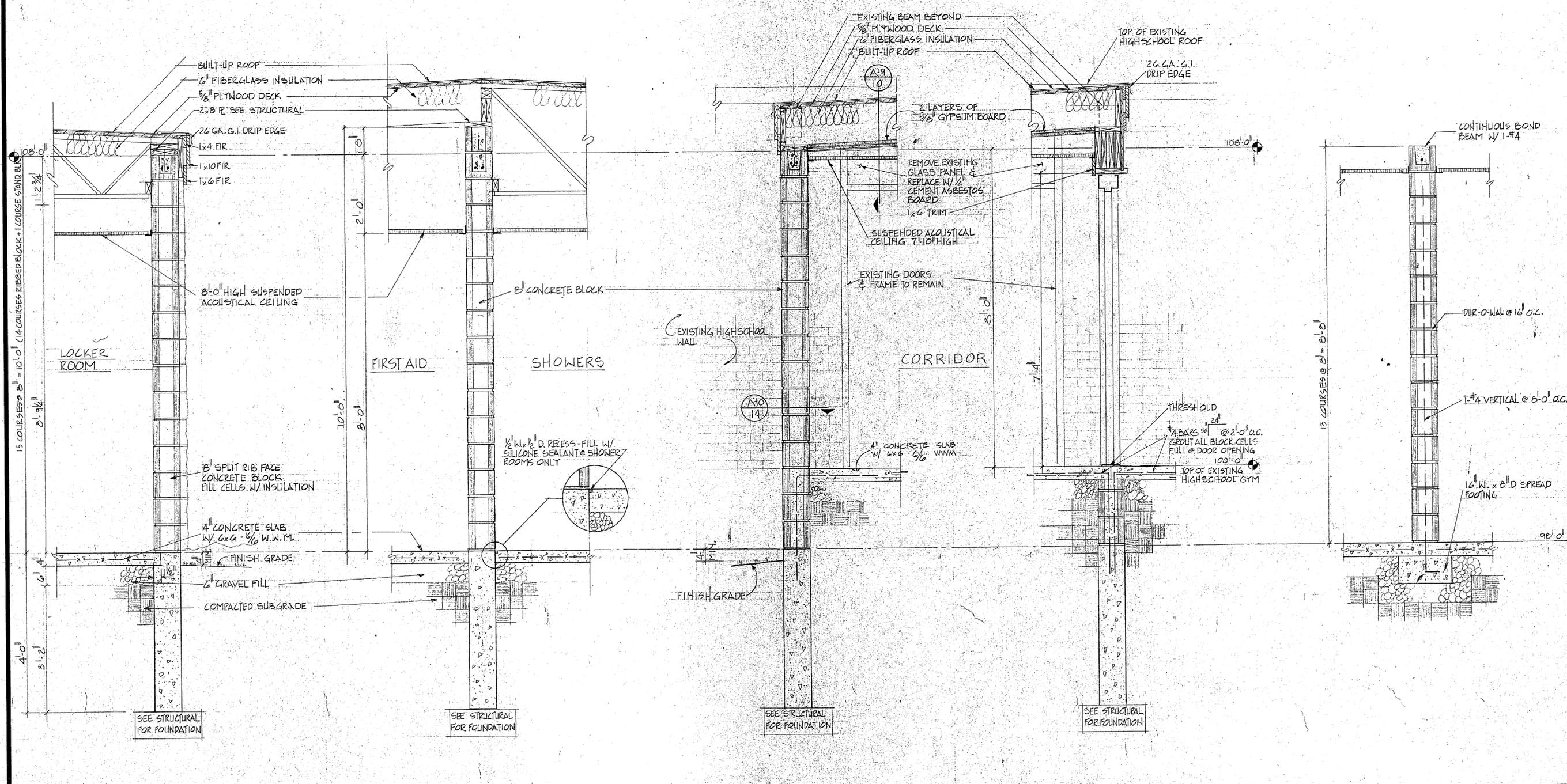
BERG-GRABOW & PARTNERS  
 ARCHITECTS-ENGINEERS-PLANNING CONSULTANTS  
 bozeman montana



(1) SECTION THRU WEST WALL @ POOL 3/4" = 1'-0" (2) SECTION THRU EAST WALL @ POOL 3/4" = 1'-0" (3) SECTION THRU FILTER TANK WALL 3/4" = 1'-0" (4) SECTION THRU POOL EQUIP EAST WALL 3/4" = 1'-0" (5) SECTION THRU LOCKER ROOM NORTH WALL 3/4" = 1'-0"



(6) OVERHANG-EAVE DETAIL 3/4" (7) WEST WALL-ROOF DETAIL 3/4" (8) FLASHING DETAIL 3/4" (9) BEARIN' WALL DETAIL 3/4" (10) ROOF DETAIL 3/4"



(1) SOUTH WALL @ LOCKER ROOMS 3/4"=1'-0" (2) NORTH WALL @ LOCKER ROOM 3/4"=1'-0" (3) NORTH WALL @ CONNECTING CORRIDOR 3/4"=1'-0" (4) SOUTH WALL @ CONNECTING CORRIDOR 3/4"=1'-0" (5) TYPICAL INTERIOR PARTITION 3/4"=1'-0"

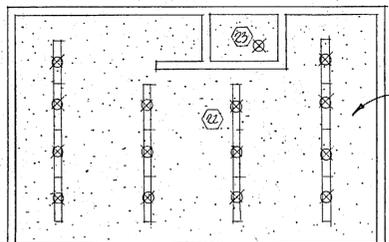




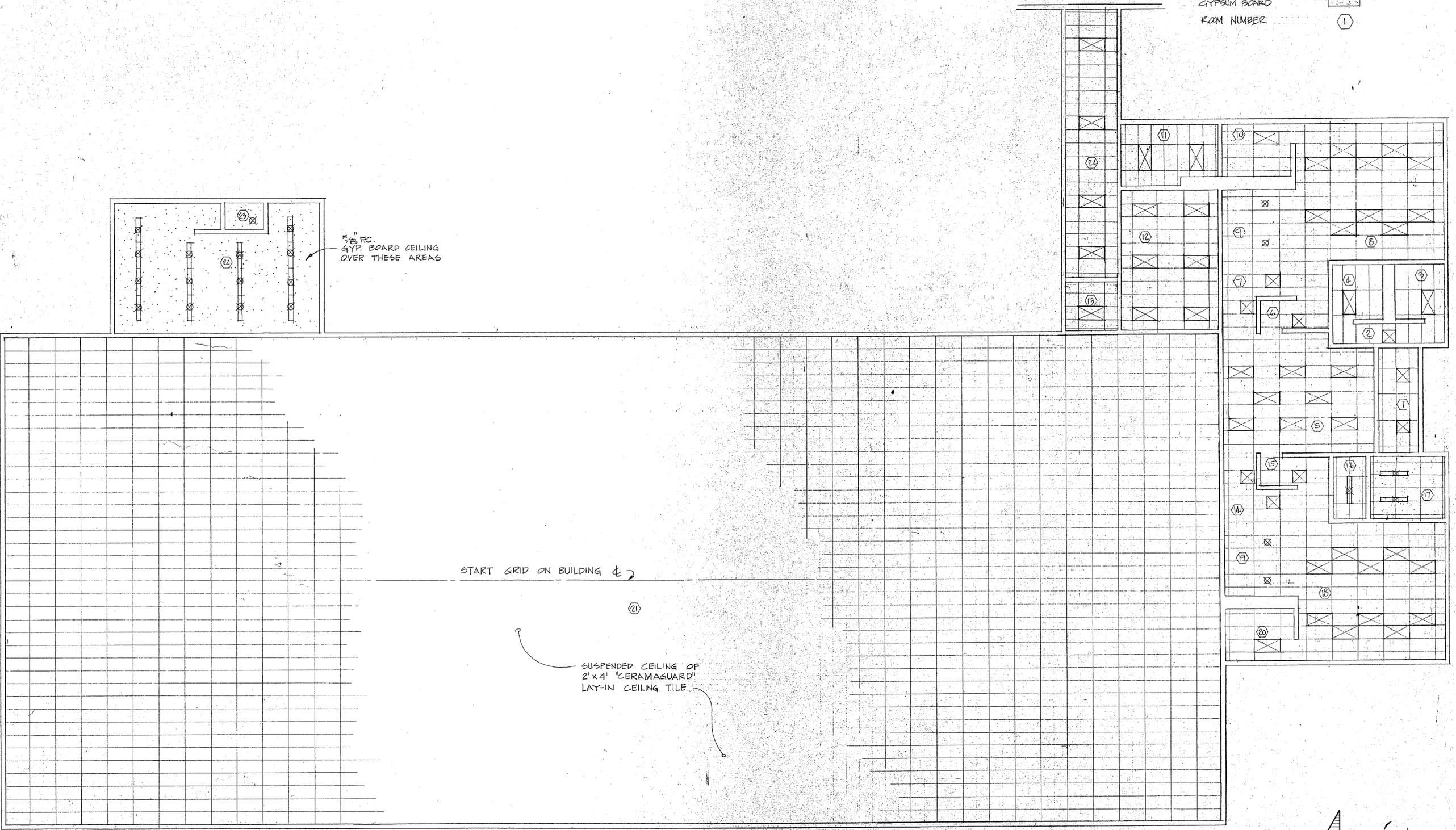


**LEGEND**

- RECESS LIGHT FIXTURE 
- SURFACE MOUNTED FIXTURE  OR 
- LAY-IN CEILING TILE 
- GYP. BOARD 
- ROOM NUMBER 

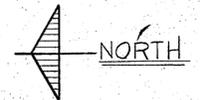


5/8" GYP. BOARD CEILING  
OVER THESE AREAS



START GRID ON BUILDING →

SUSPENDED CEILING OF  
2' x 4' CERAMAGUARD®  
LAY-IN CEILING TILE



DRAWINGS MAY BE  
REPRODUCED FOR  
PERSONAL USE ONLY.  
ALL MATERIALS AND  
METHODS OF CONSTRUCTION  
SHOWN ARE NOT SHOWN  
HEREIN. CONSULT THE  
RECOMMENDATIONS  
OF THE ARCHITECT  
OR OTHERS  
AS APPLICABLE.  
Drawn by

SHEET NUMBER	DETAIL NUMBER

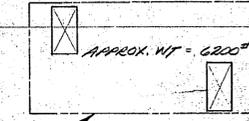
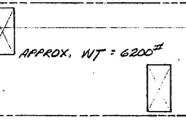
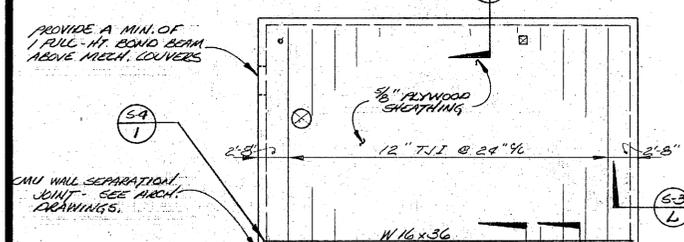
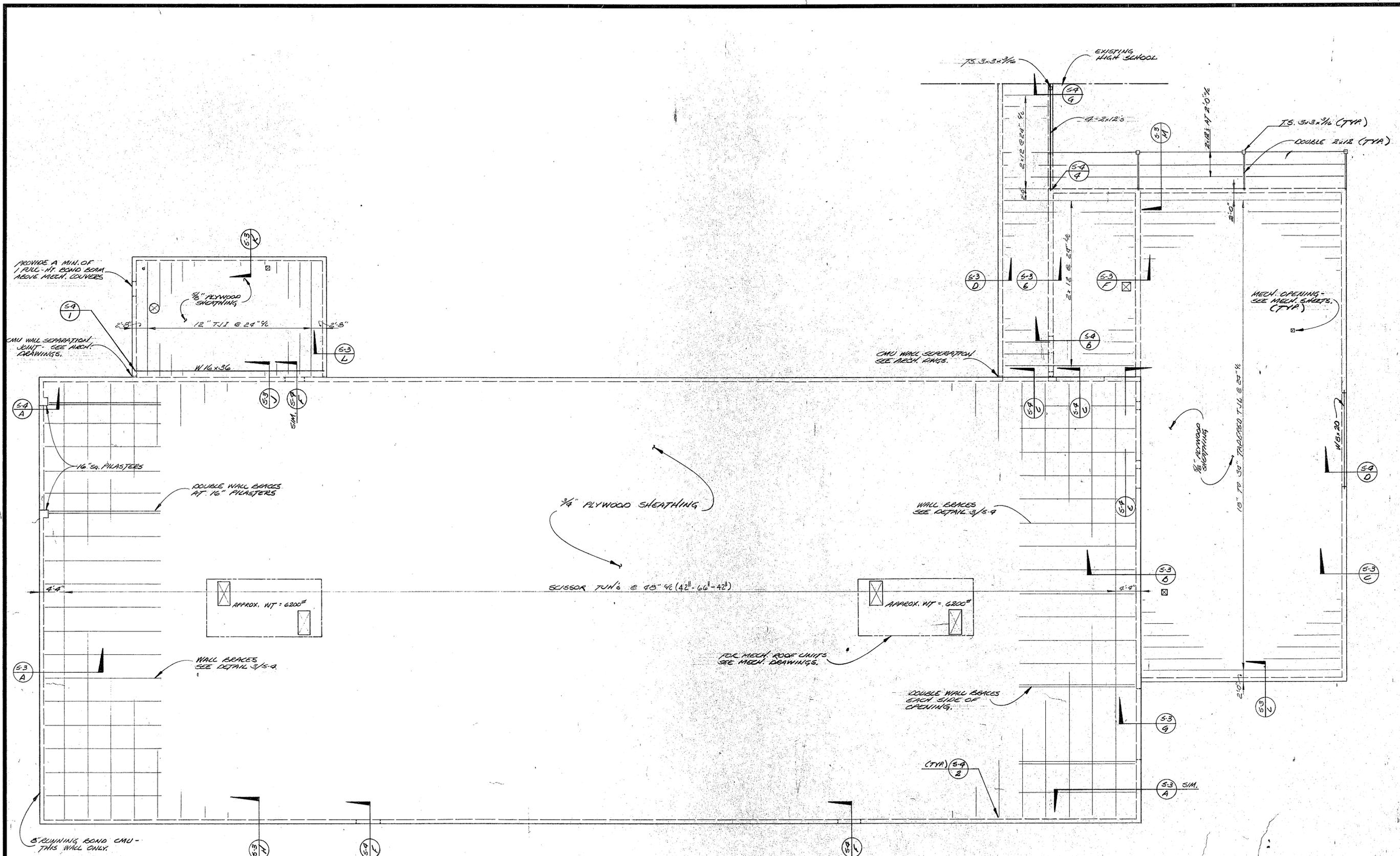
DETAIL KEY

OWNER CITY OF BOZEMAN, MONTANA  
PROJECT BOZEMAN MUNICIPAL POOL  
SHEET REFLECTED CEILING PLAN

**BERG-GRABOW & PARTNERS**  
ARCHITECTS-ENGINEERS-PLANNING CONSULTANTS  
bozeman montana

JOB NO. 7407  
DEC. 1974  
A-12  
OF 12

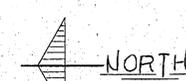




- JOIST NOTES:**
1. MANUFACTURER TO SUPPLY ALL BRIDGING AS REQUIRED, IN ADDITION TO THAT SHOWN IN DETAIL 3/S-9.
  2. MANUFACTURER TO DESIGN JOISTS FOR M.E. UNITS AND OTHER SPECIAL LOADINGS AS REQUIRED.
  3. SEE DETAIL 2/S-9 FOR ERECTION PROCEDURE.

- PLYWOOD SHEATHING NOTES:**
1. PLYWOOD SHEETS TO BE PLACED WITH FACE GRAIN RUNNING PERPENDICULAR TO JOISTS.
  2. PLYWOOD SHEET JOINTS PARALLEL TO JOISTS TO BE STAGGERED.
  3. NAILING:
    - A. ROOF AREA AND EQUIPMENT ROOM: 10d NAILS AT 6" x 6" AT ALL SUPPORTED EDGES AND AT 12" x 6" AT INTERMEDIATE SUPPORTS O.N.
    - B. EDGE WHERE 2" x 8" NAILS AT 6" x 6" AT ALL SUPPORTED EDGES AND AT 12" x 6" AT INTERMEDIATE SUPPORTS.
  4. ALL PLYWOOD PANEL EDGES OF THE ROOF OVER THE EXIST. BUILDING SHALL BE BLOCKED WITH 2"x4" BLOCKING.

**ROOF PLAN - BASE BID**



---

**ENGINEER:** HULLBUT - REISCH - MC CULLOUGH  
 DRAWINGS MAY BE REPRODUCED FOR ALL MATERIALS AND METHODS OF CONSTRUCTION TO BE INSTALLED ACCORDING TO MANUFACTURER'S INSTRUCTIONS UNLESS SPECIFIED OTHERWISE.

---

**OWNER:** CITY OF BOZEMAN, MONTANA  
**PROJECT:** BOZEMAN MUNICIPAL POOL  
**SHEET:** STRUCTURAL ROOF PLAN - BASE BID

---

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**ARCHITECTS-ENGINEERS-PLANNING CONSULTANTS**  
**bozeman montana**

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JOB NO. 7407  
 DEC. 1974  
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 OF 5

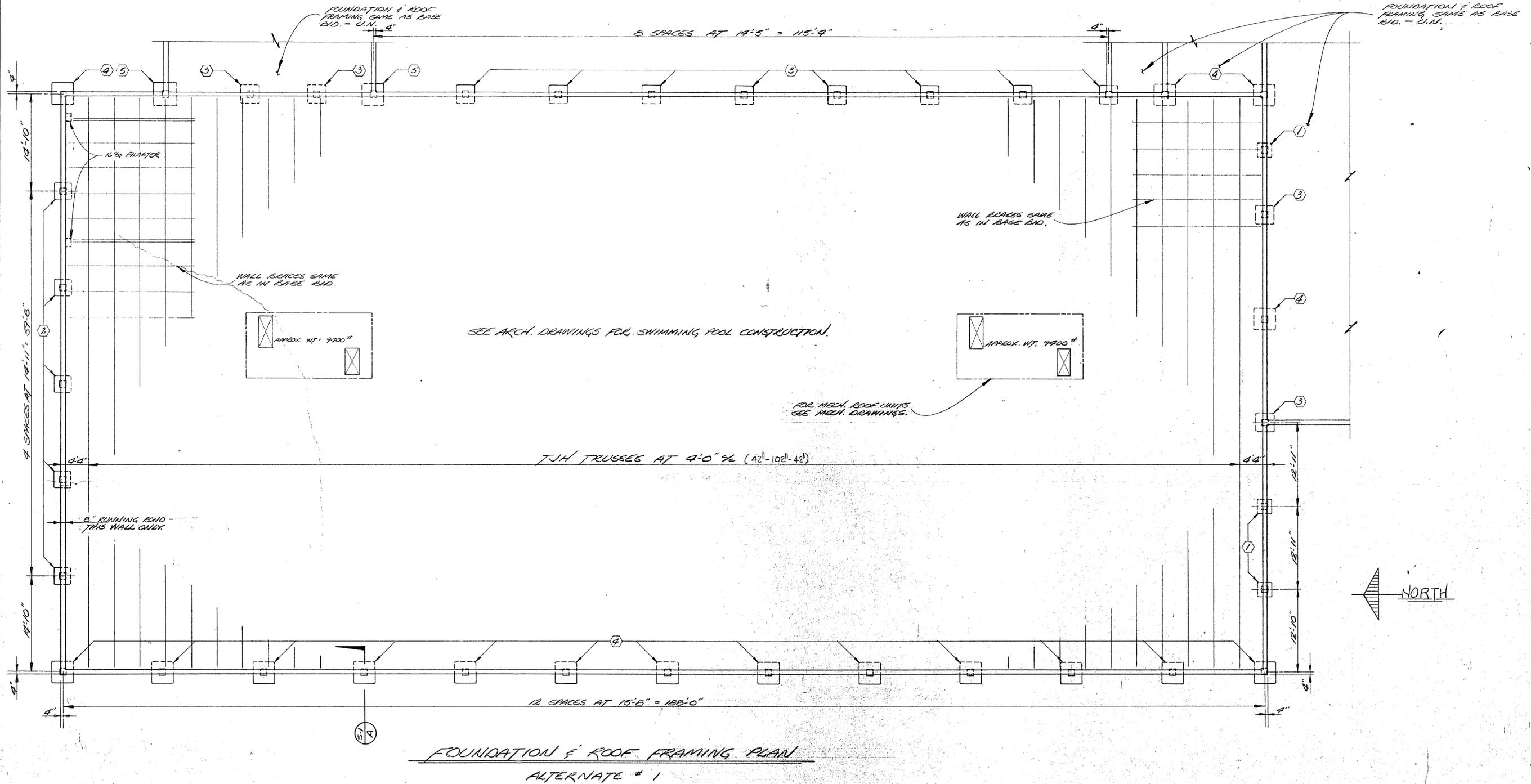




PAD FOOTING SCHEDULE		
MARK	SIZE	REBAR
①	2'-9" Sq x 12"	3" #4 EACH WAY
②	2'-8" Sq x 12"	3" #4 EACH WAY
③	3'-0" Sq x 12"	4" #4 EACH WAY
④	3'-4" Sq x 12"	4" #5 EACH WAY
⑤	3'-8" Sq x 12"	4" #6 EACH WAY

NOTE:

- ALL SECTIONS SHOWN ON SHEETS 5-3 AND 5-4 ALSO APPLY TO THE ALTERNATE DESIGN U.N.
- T.J. TO DESIGN JOISTS FOR M.E. ROOF UNITS AS REQUIRED.
- ALL SLAB REINF., ROOF RAFTING, CAYOUT, AND BLOCKING, AND WALL BRACING AS SHOWN ON SHEETS 5-1 AND 5-2 SHALL BE SIMILARLY APPLIED TO THE ALTERNATE #1 U.N.



ENGINEER  
HULBUT - KERICH - NO COLLUUGH

OWNER  
CITY OF BOZEMAN, MONTANA

PROJECT  
BOZEMAN MUNICIPAL POOL

SHEET  
STRUCTURAL - FOUNDATION & ROOF FRAMING PLAN - ALTERNATE # 1

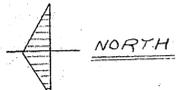
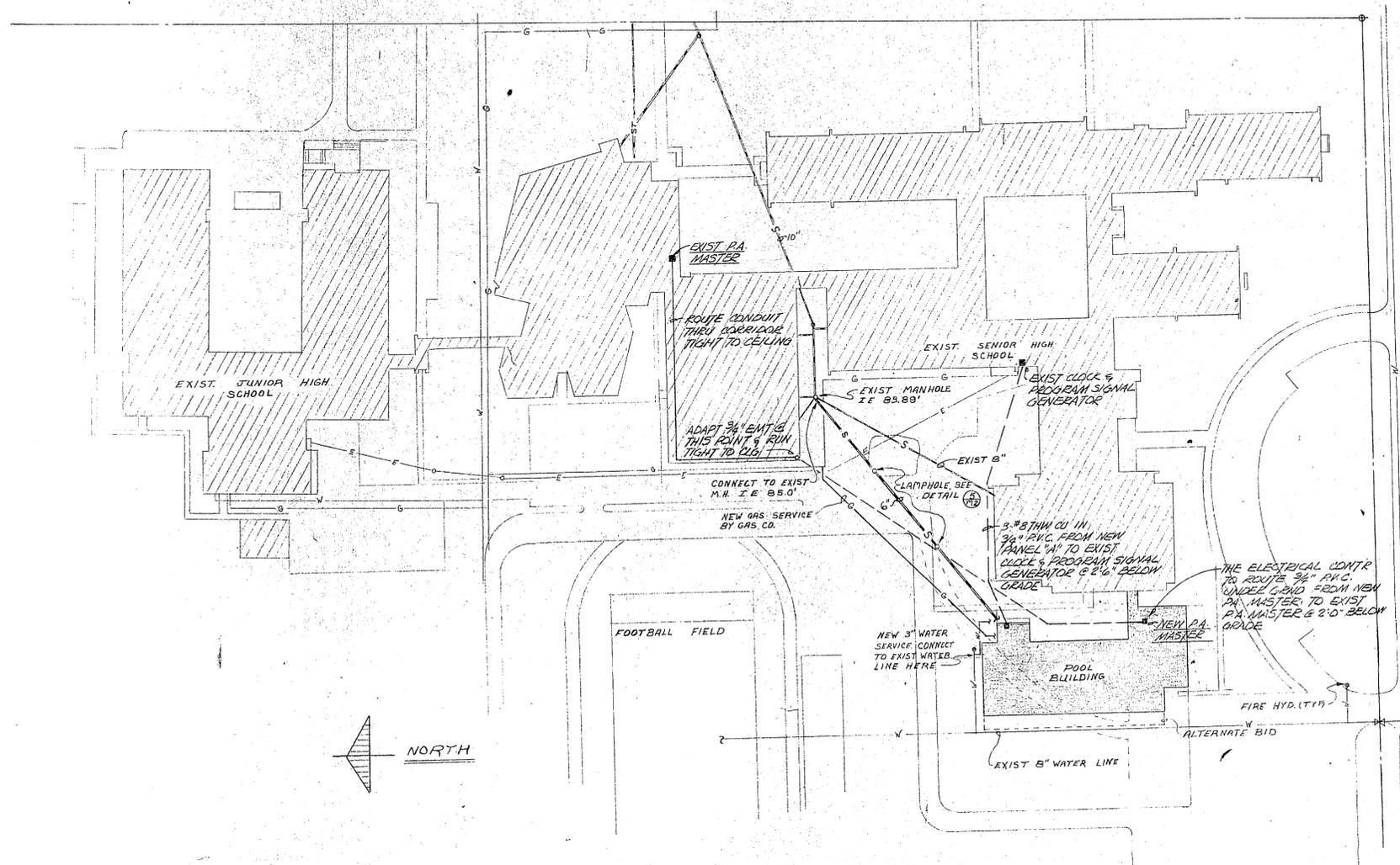
Drawn By

DETAIL KEY

RECOMMENDATIONS UNLESS OTHERWISE INDICATED

**BERG-GRABOW & PARTNERS**  
ARCHITECTS-ENGINEERS-PLANNING CONSULTANTS  
bozeman montana

JOB NO. 7407  
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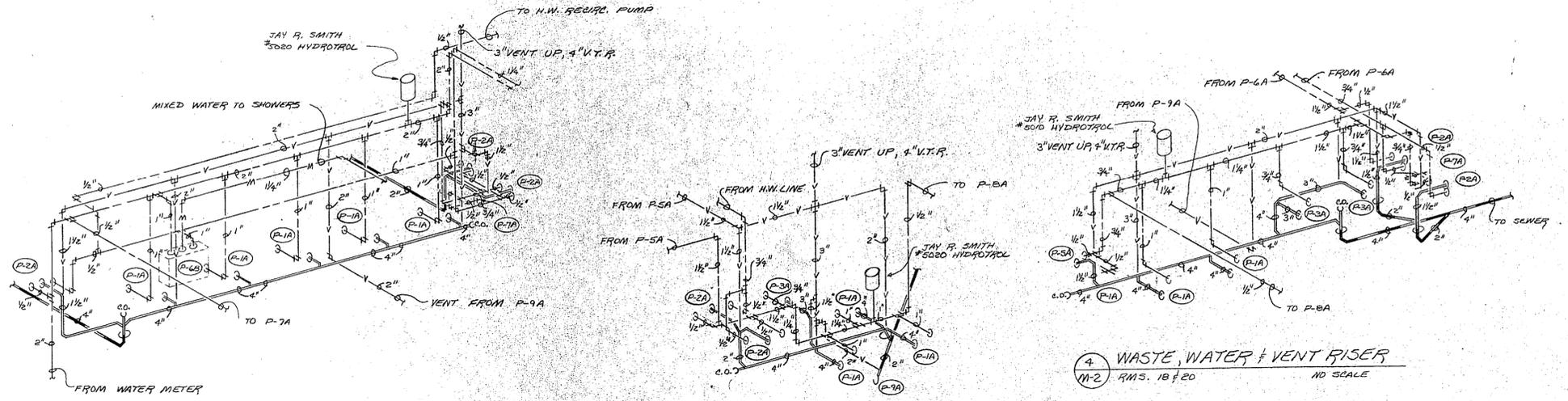


1  
ME1 SITE PLAN SCALE 1"=80'

JOB NO. 7407 DEC. 1974	OWNER CITY OF BOZEMAN, MONTANA		ENGINEER						
	PROJECT BOZEMAN MUNICIPAL POOL		SHEET N E SITE PLAN						
BERG-GRABOW & PARTNERS ARCHITECTS-ENGINEERS-PLANNING CONSULTANTS bozeman montana		<small>UNLESS NOTED TO THE CONTRARY, ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED.</small> <small>UNLESS NOTED TO THE CONTRARY, ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED.</small> <small>UNLESS NOTED TO THE CONTRARY, ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED.</small>							
		<table border="1"> <tr> <td>SHEET NUMBER</td> <td>DETAIL NUMBER</td> <td>DETAIL KEY</td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table>		SHEET NUMBER	DETAIL NUMBER	DETAIL KEY			
SHEET NUMBER	DETAIL NUMBER	DETAIL KEY							

PLUMBING FIXTURE SCHEDULE

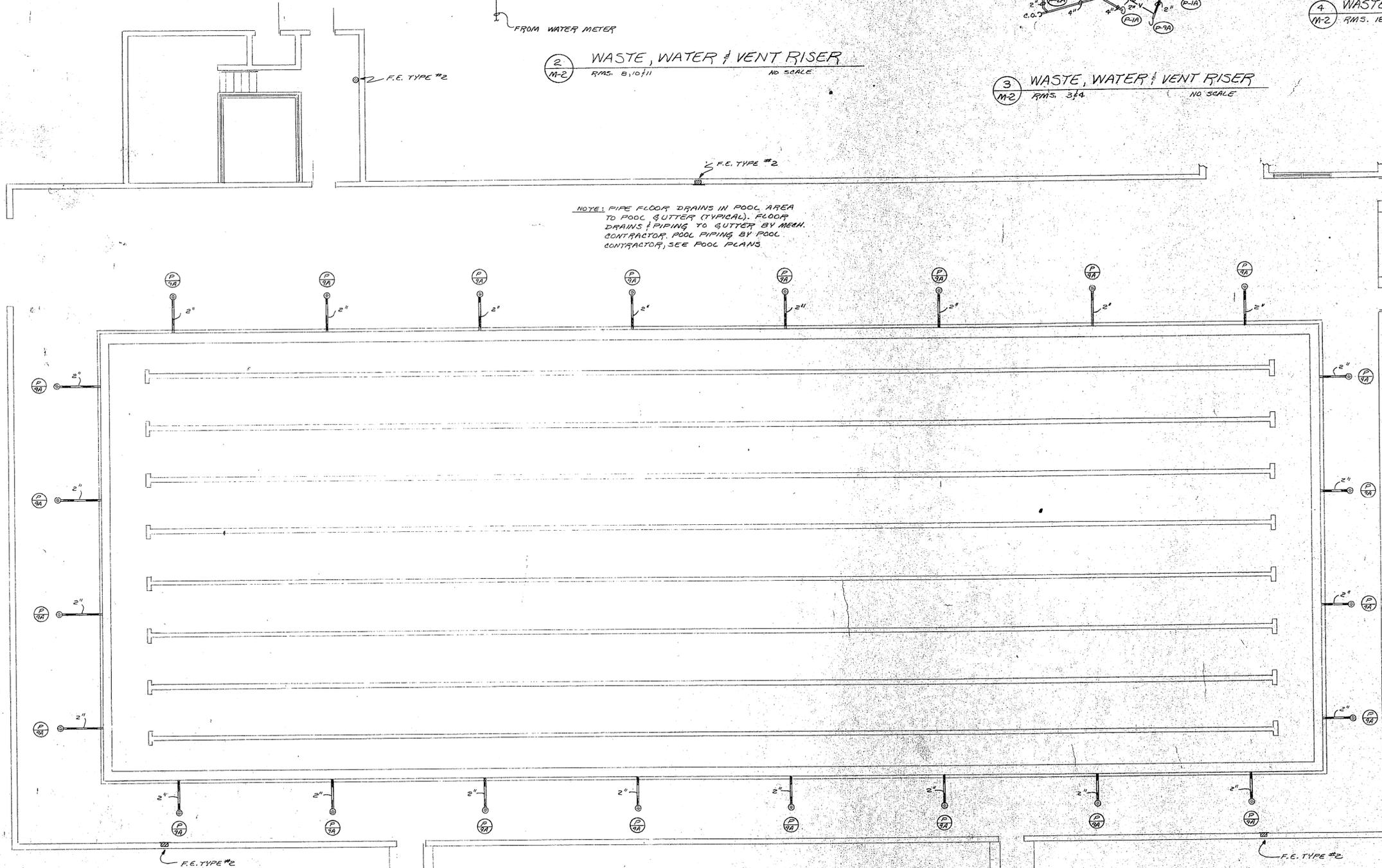
MARK	FIXTURE DESCRIPTION	PIPE SIZE (INCHES)				REMARKS
		CW	HW	WASTE	VENT	
P-1A	WATER CLOSET	1	-	4	2	WALL MOUNTED @ 15" TO RIM
P-1B	WATER CLOSET	1	-	4	2	HANDICAPPED, MT'D @ 18" TO RIM
P-2A	LAVATORY	1/2	1/2	1 1/2	1 1/2	MT'D @ 31" HANDICAPPED MT'D @ 32" BELOW 5TH OF RIM
P-3A	URINAL	3/4	-	3	1 1/2	MT'D @ 24"
P-4A	MOP BASIN	1/2	1/2	3	1 1/2	FLOOR MT'D.
P-5A	DRINKING FOUNTAIN	1/2	-	1 1/2	1 1/2	
P-6A	SHOWER	1/2	1/2	-	-	MT'D @ 6'-0"
P-7A	HOSE BIBB	1/2	-	-	-	
P-8A	WALL HYDRANT	1/2	-	-	-	MT'D @ 16" ABOVE GRADE
P-9A	FLOOR DRAIN	-	-	2	2	
P-9B	FLOOR DRAIN	-	-	6	3	
P-6B	SHOWER MIXER	1"	1"	-	-	CABINET MOUNTED



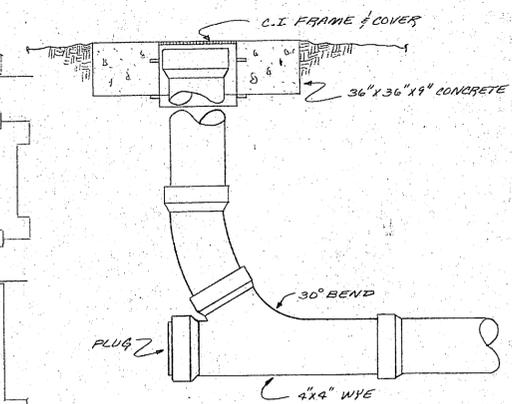
2 WASTE, WATER & VENT RISER  
M-2 R.M.S. 8, 10 & 11 NO SCALE

3 WASTE, WATER & VENT RISER  
M-2 R.M.S. 3 & 4 NO SCALE

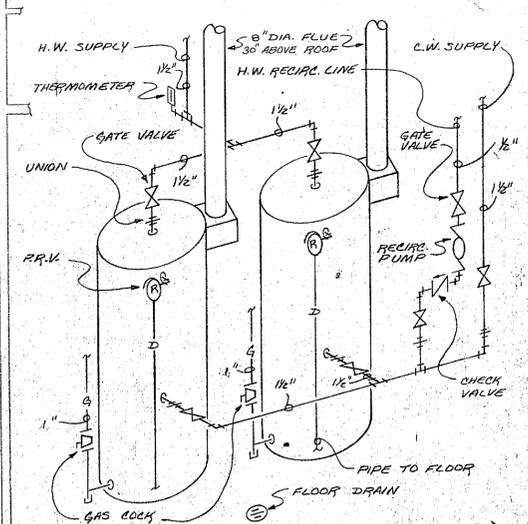
4 WASTE, WATER & VENT RISER  
M-2 R.M.S. 18 & 20 NO SCALE



1 FLOOR PLAN-PLUMBING - ALTERNATE BID  
M-2 SCALE: 1/8" = 1'-0"



5 LAMP HOLE DETAIL  
M-2 NO SCALE



6 WATER HEATER DETAIL  
M-2 R.M. 16 NO SCALE

ENGINEER  
CITY OF BOZEMAN, MONTANA  
BOZEMAN MUNICIPAL POOL  
PLUMBING PLAN

OWNER  
PROJECT  
SHEET

BERG GRABOW & PARTNERS  
ARCHITECTS-ENGINEERS-PLANNING CONSULTANTS  
bozeman montana

JOB NO. 7407  
DEC. 1974  
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OF 5

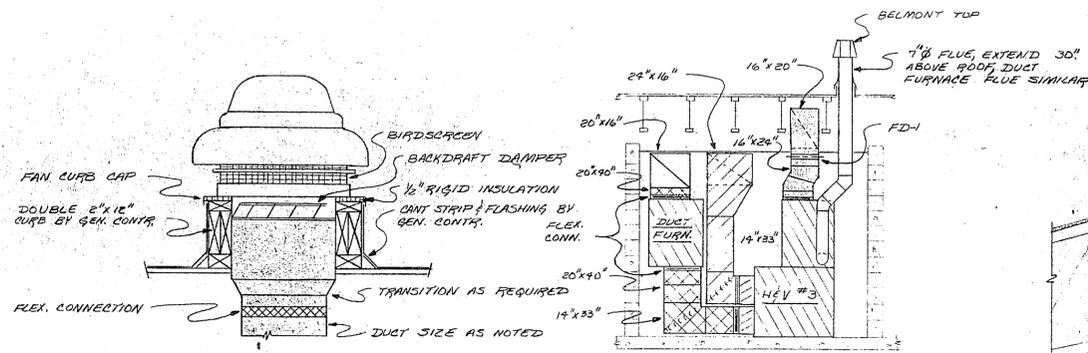


ENGINEER  
CITY OF BOZEMAN, MONTANA  
PROJECT BOZEMAN MUNICIPAL POOL  
SHEET HEATING & VENTILATING PLAN

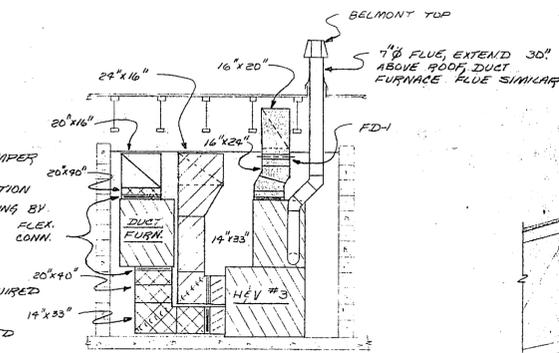
BOZEMAN MUNICIPAL POOL  
HEATING & VENTILATING PLAN  
SHEET

**BERG-GRABOW & PARTNERS**  
ARCHITECTS-ENGINEERS-PLANNING CONSULTANTS  
bozeman montana

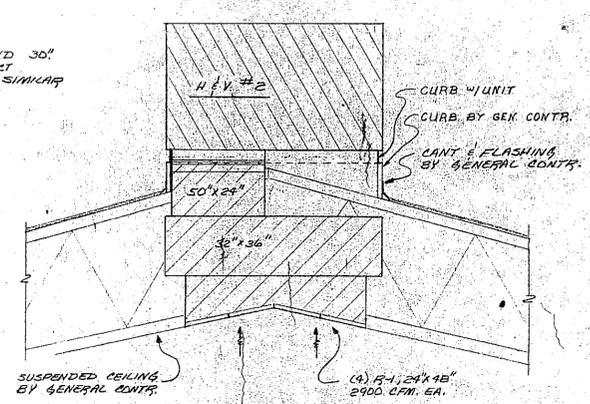
JOB NO. 7407  
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OF 5



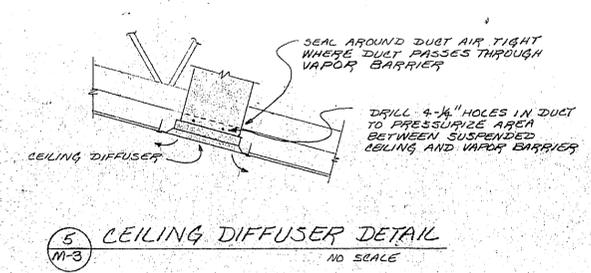
2 EXHAUST FAN DETAIL  
NO SCALE



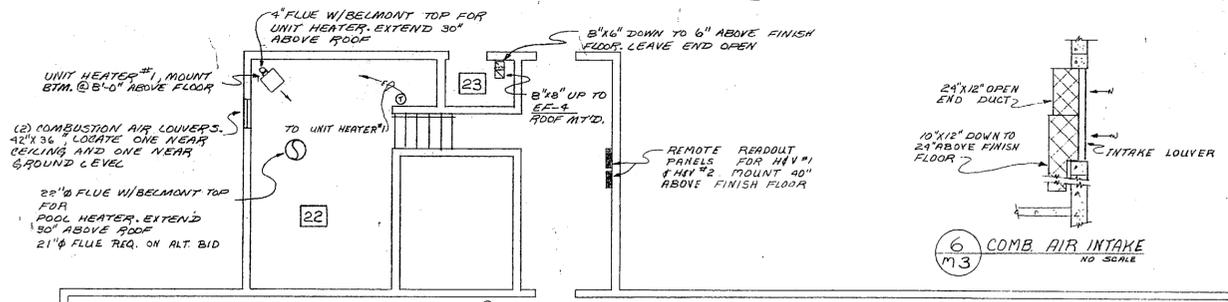
3 SECTION A-A  
SCALE: 1/4" = 1'-0"



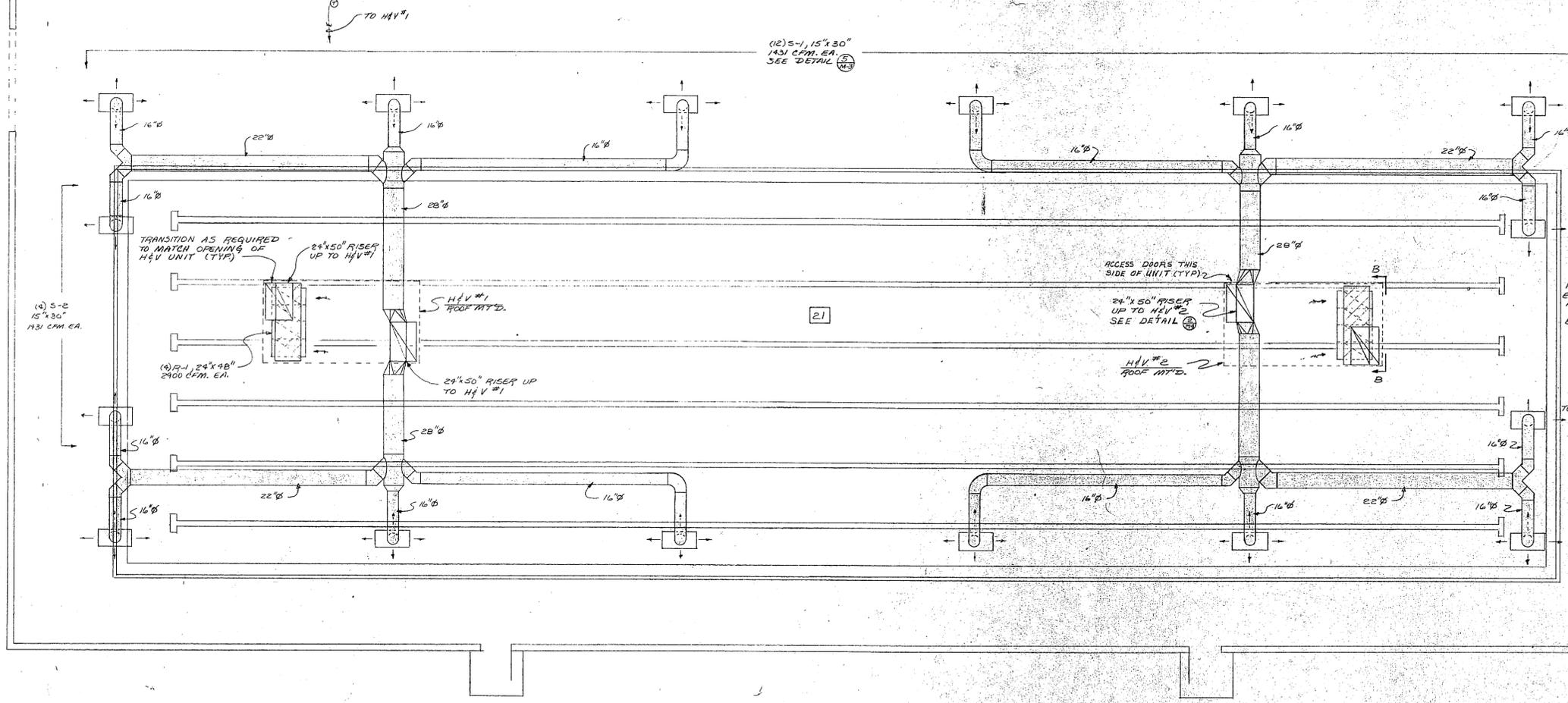
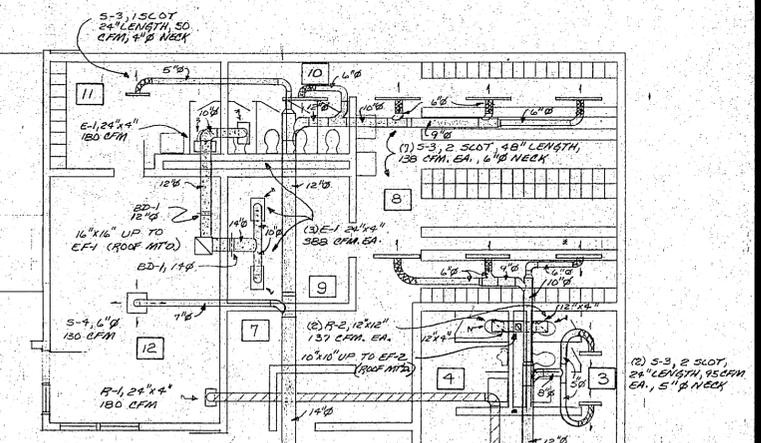
4 SECTION B-B  
SCALE: 1/4" = 1'-0"



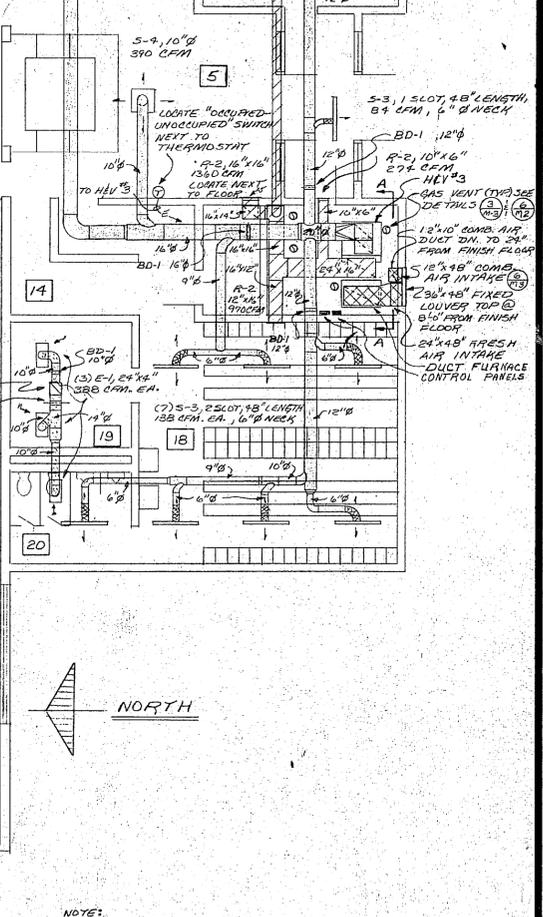
5 CEILING DIFFUSER DETAIL  
NO SCALE



6 COMB AIR INTAKE  
NO SCALE



1 FLOOR PLAN - HEATING & VENTILATING - BASE BID  
SCALE: 1/8" = 1'-0"



NOTE:  
DUCT WORK IN POOL AREA SHOWN  
HORIZONTAL FOR CLARITY PURPOSES  
ALL DUCT WORK IN TRUSS-JOISTS.

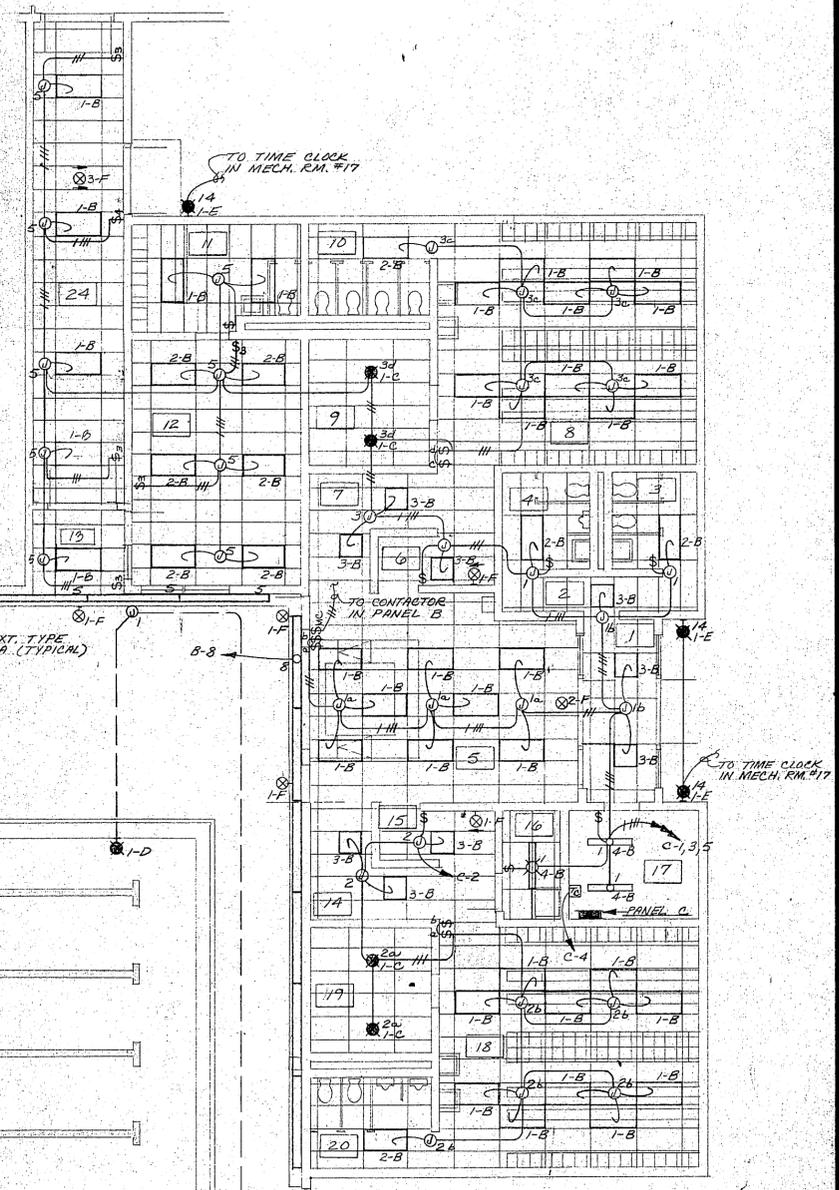
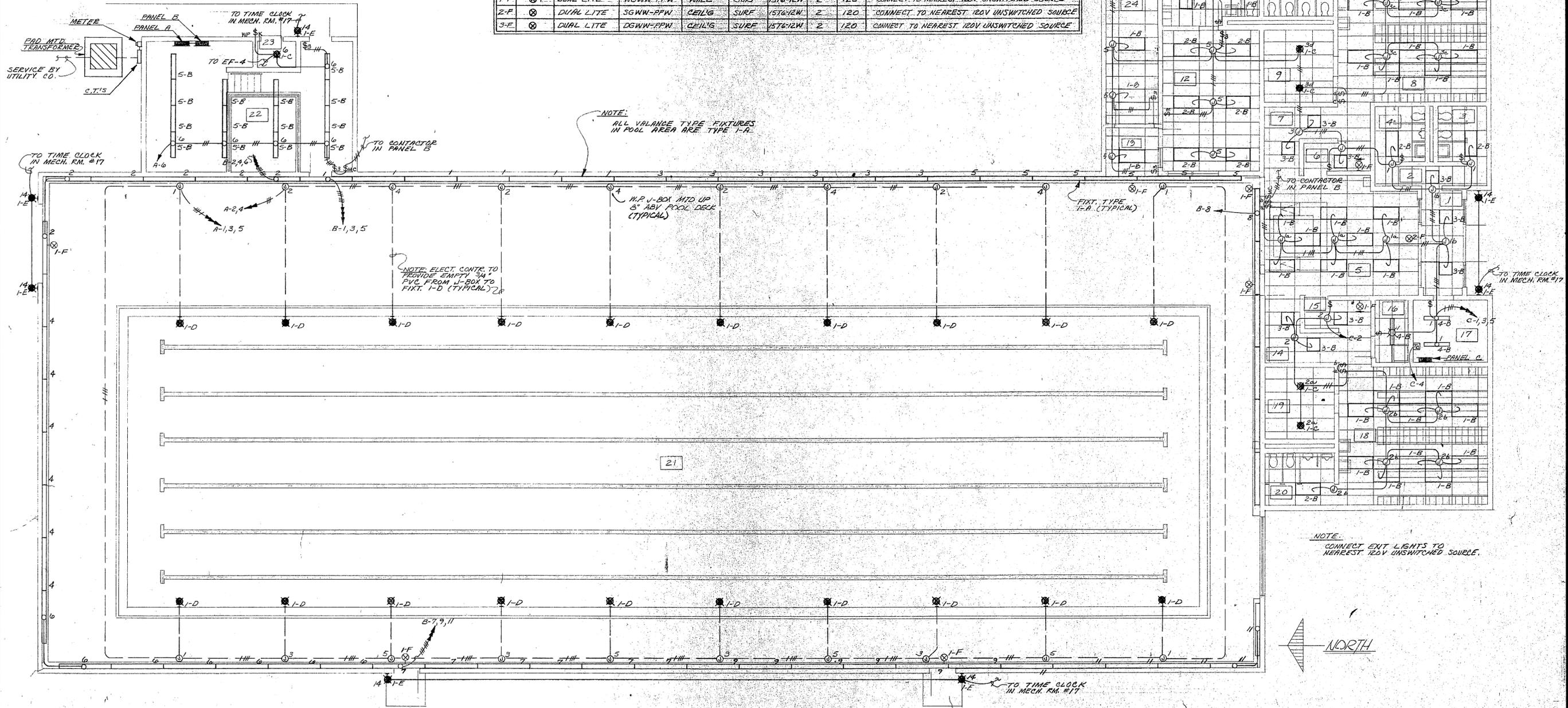


**ELECTRICAL LEGEND**

- PANEL
- HOME RUN TO PANEL NO. OF ARROWS INDICATES NO. OF CKTS.
- NO. OF HASH MARKS INDICATES NO. OF CONDUCTORS IN CONDUIT. NO HASH MARKS INDICATES TWO CONDUCTORS.
- CONDUIT CONCEALED IN CEILING OR WALL
- CONDUIT: EMPTY
- CONDUIT CONCEALED IN/OR UNDER FLOOR
- FLEX CONDUIT
- SPECIAL CABINETS
- LIGHT FIXTURE, FLUORESCENT
- LIGHT FIXTURE, INCANDESCENT, WALL MTD.
- LIGHT FIXTURE, INCANDESCENT
- EXIT LIGHT, WALL MTD.
- SWITCH
- SWITCH, 3-WAY
- WEATHERPROOF
- SUBSCRIPT INDICATES SWITCHING
- DUCT SMOKE DETECTOR
- SMOKE DETECTOR, REMOTE STATION
- SWITCH, 4-WAY
- SWITCH, KEY OPERATED
- MOTOR STARTER, SEE SCHEDULE
- OUTLET, DUPLEX
- OUTLET, WEATHERPROOF
- OUTLET, MOTOR
- OUTLET, THERMOSTAT
- OUTLET, SPECIAL PURPOSE
- OUTLET, SPEAKER
- JUNCTION BOX
- OUTLET, CLOCK, MT. AT 7'-0" UNLESS NOTED
- TIME CLOCK
- FIRE ALARM BREAK GLASS STATION
- FIRE ALARM BELL SINGLE PROJECTED
- OUTLET, TELEPHONE, PRIVATE
- SWITCH, MOMENTARY CONTACT
- OUTLET, TELEPHONE, PUBLIC
- PROGRAM BELL

**FIXTURE SCHEDULE**

LETTER	FIXTURE		LOCATION	TYPE	LAMP	FIXT. VOLT.	REMARKS
	SYMBOL	MFGR.					
1-A	☒	FORUM	BAG-7272	WALL SURF	F40CW 150W	2	CONTINUOUS ROWS MITERED AT ENDS. MT. @ 9'-6"
1-B	☐	WAKEFIELD	TH2248-SS	CEILING RECESS	F40CW	2	120
2-B	☐		TH4248-SS	RECESS	F40CW	4	120
3-B	☐		THU-2226-SS	RECESS	F40CW	2	120
4-B	☐		PH-118T-SS	SURF	F40CW	2	120
5-B	☐		ON-214	SURF	F40CW	2	120
1-C	☐	DEVINE	A18T76-C43	CEILING RECESS	100W	2	120
1-D	☐	AQUATECH	*2-III-N	POOL WALL RECESS	500W	1	120 FIKT. TO BE PROVIDED & INSTALLED BY POOL EQUIP. MGR. - CONNECTED BY ELEC. CONTR. TO J-BOX
1-E	☐	PRESCOLITE	WB-48	WALL SURF	100W	1	120 BRONZOTIC FINISH
1-F	☐	DUAL LITE	WGWN-PPW	WALL SURF	1576-12W	2	120 CONNECT TO NEAREST 120V UNSWITCHED SOURCE
2-F	☐	DUAL LITE	SGWN-PPW	CEILING SURF	1576-12W	2	120 CONNECT TO NEAREST 120V UNSWITCHED SOURCE
3-F	☐	DUAL LITE	DGWN-PPW	CEILING SURF	1576-12W	2	120 CONNECT TO NEAREST 120V UNSWITCHED SOURCE



NOTE:  
ALL VALLANCE TYPE FIXTURES  
IN POOL AREA ARE TYPE 1-A.

NOTE: ELEC. CONTR. TO  
PROVIDE EMPTY 3/4"  
PVC FROM J-BOX TO  
FIKT. 1-D (TYPICAL)

NOTE:  
CONNECT EXIT LIGHTS TO  
NEAREST 120V UNSWITCHED SOURCE.

1 FLOOR PLAN - LIGHTING CASE BID  
E1 SCALE: 1/8" = 1'-0"



**ENGINEER**

CITY OF BOZEMAN, MONTANA

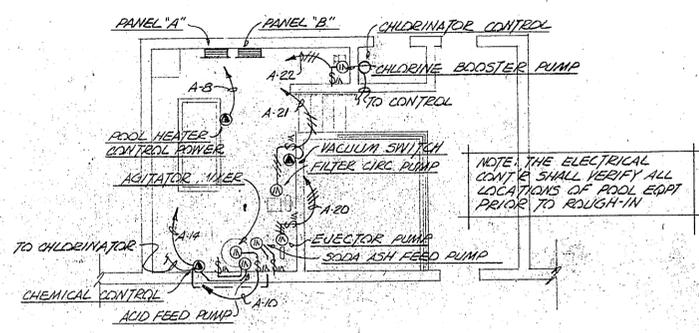
BOZEMAN MUNICIPAL POOL

LIGHTING PLAN

OWNER: BERG-GRABOW & PARTNERS  
ARCHITECTS-ENGINEERS-PLANNING CONSULTANTS  
bozeman montana

JOB NO. 7407  
DEC. 1974

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OF 3



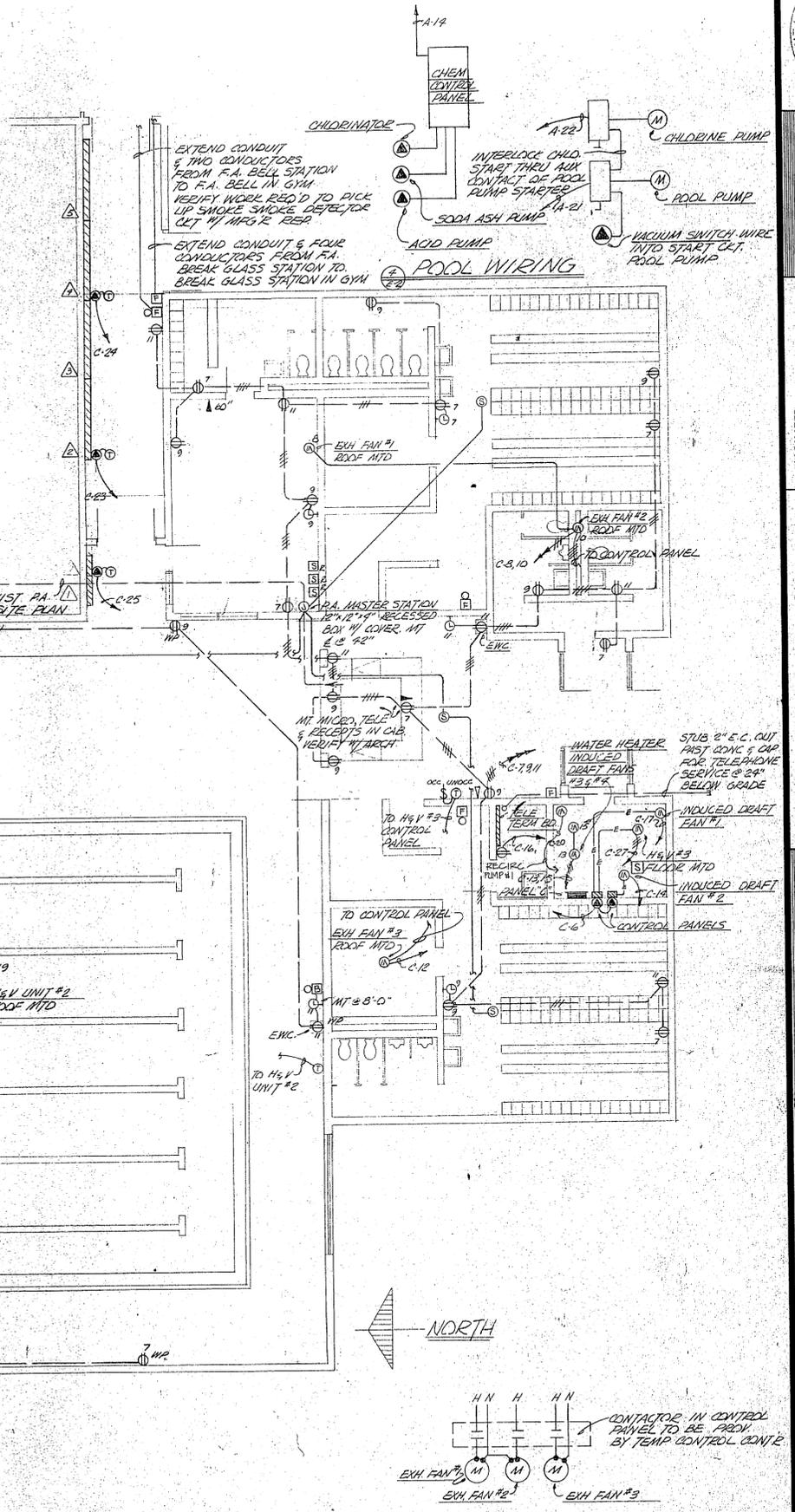
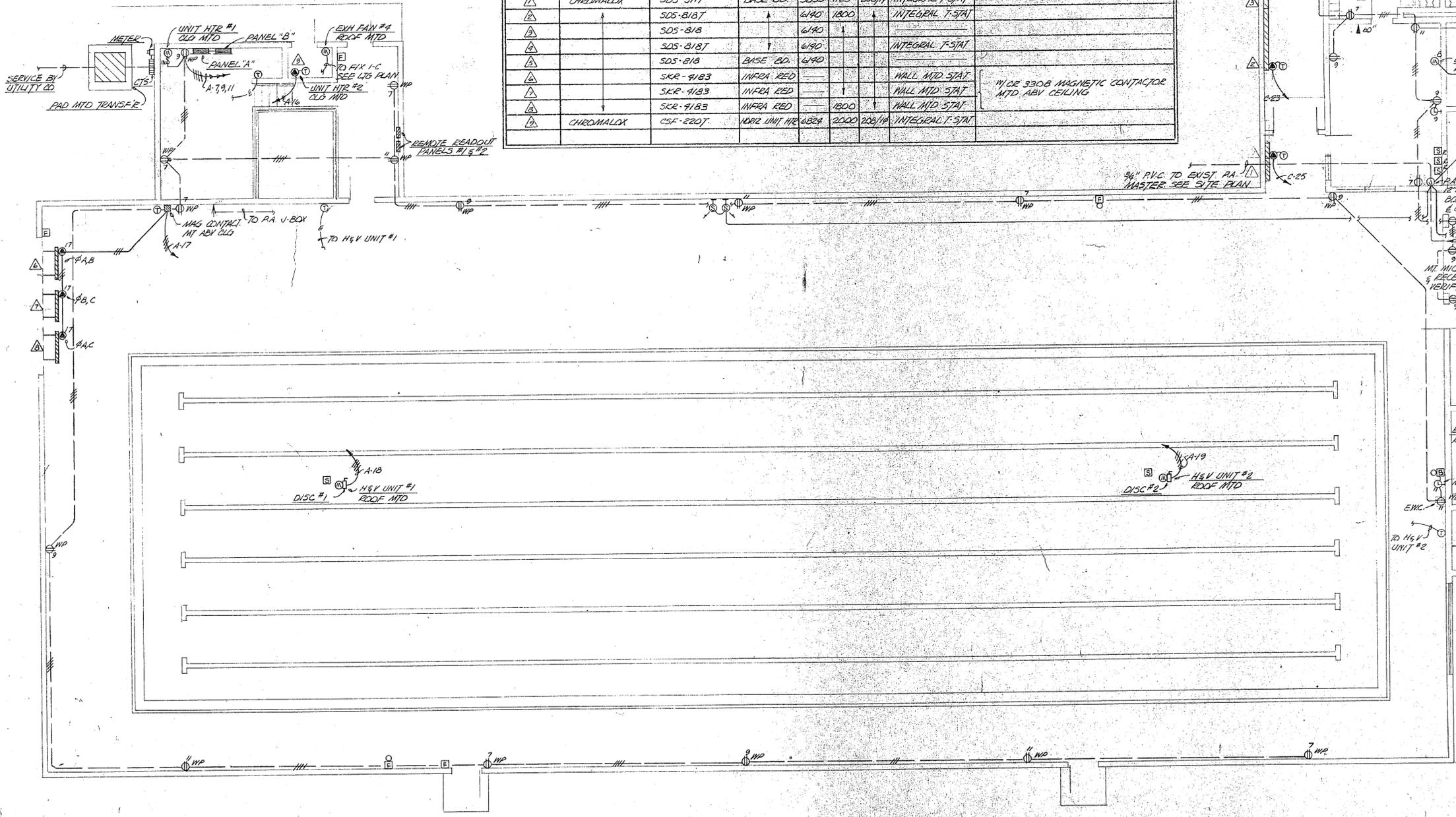
### PANEL & DISC. SCHEDULE

RM. NO.	CODE	TYPE	VOLTA GE	MINIS	BOX DEPTH	FEED	MOUNTING	REMARKS
	PANEL A	GE/MLAB	120/208V, 3P, 4W	400	5 3/4"	BOTTOM	SURFACE	1 1/2" 300A MAIN BREAK
	PANEL B	GE/MLAB	120/208V, 3P, 4W	100	5 3/4"	SIDE	SURFACE	1 1/2" 60MB5522A CONTACTOR
	PANEL C	GE/MLAB	120/208V, 3P, 4W	100	5 3/4"	BOTTOM	SURFACE	
ROOF	DISC. #1	GE	208V, 3P	60A		BOTTOM	SURFACE	@ UNIT, DISC. H&V UNIT #1
ROOF	DISC. #2	GE	208V, 3P	60A		BOTTOM	SURFACE	@ UNIT, DISC. H&V UNIT #2

NOTE: DISCONNECTS #1 & #2 WILL NOT CHANGE UNDER ALTERNATE BID

### ELECTRIC HEATING SCHEDULE

SYMBOL	MFGR	CPT. NO.	TYPE	BTUH	WIRTS	VOLTS	CONTROL	REMARKS
△	CHROMALOX	SDS-5117	BASE BD.	3850	1125	208/1P	INTEGRAL T-STAT	
△		SDS-8187		6140	1800		INTEGRAL T-STAT	
△		SDS-818		6140			INTEGRAL T-STAT	
△		SDS-8187		6140			INTEGRAL T-STAT	
△		SDS-818	BASE BD.	6140				
△		SKR-9183	INFRA RED				WALL MTD STAT	1 1/2" GE 530B MAGNETIC CONTACTOR MTD ABV CEILING
△		SKR-9183	INFRA RED				WALL MTD STAT	
△		SKR-9183	INFRA RED	1800			WALL MTD STAT	
△	CHROMALOX	CSF-2207	INDRZ UNIT HTR	6884	2000	208/1P	INTEGRAL T-STAT	

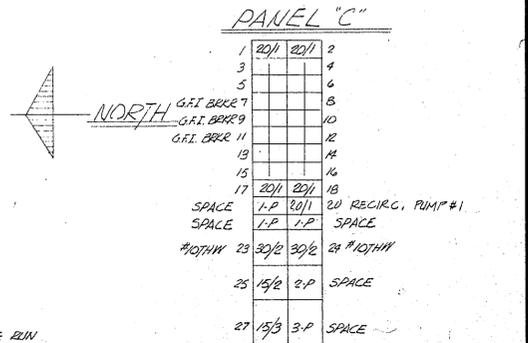
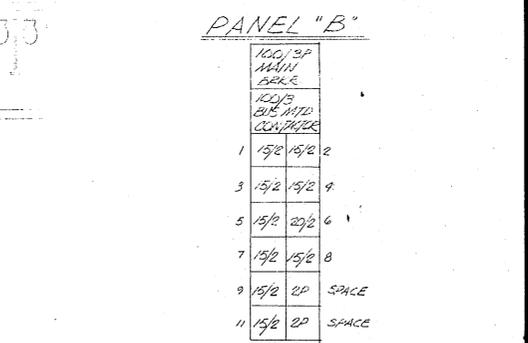
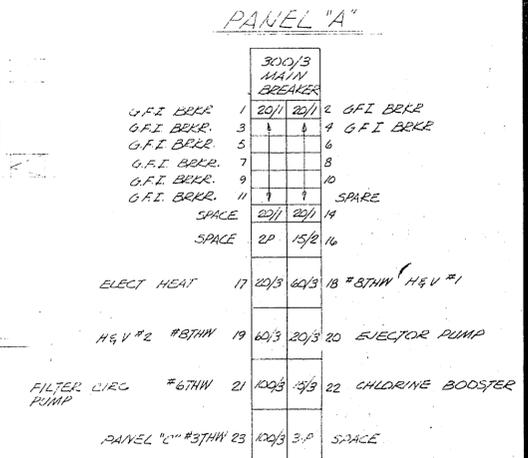
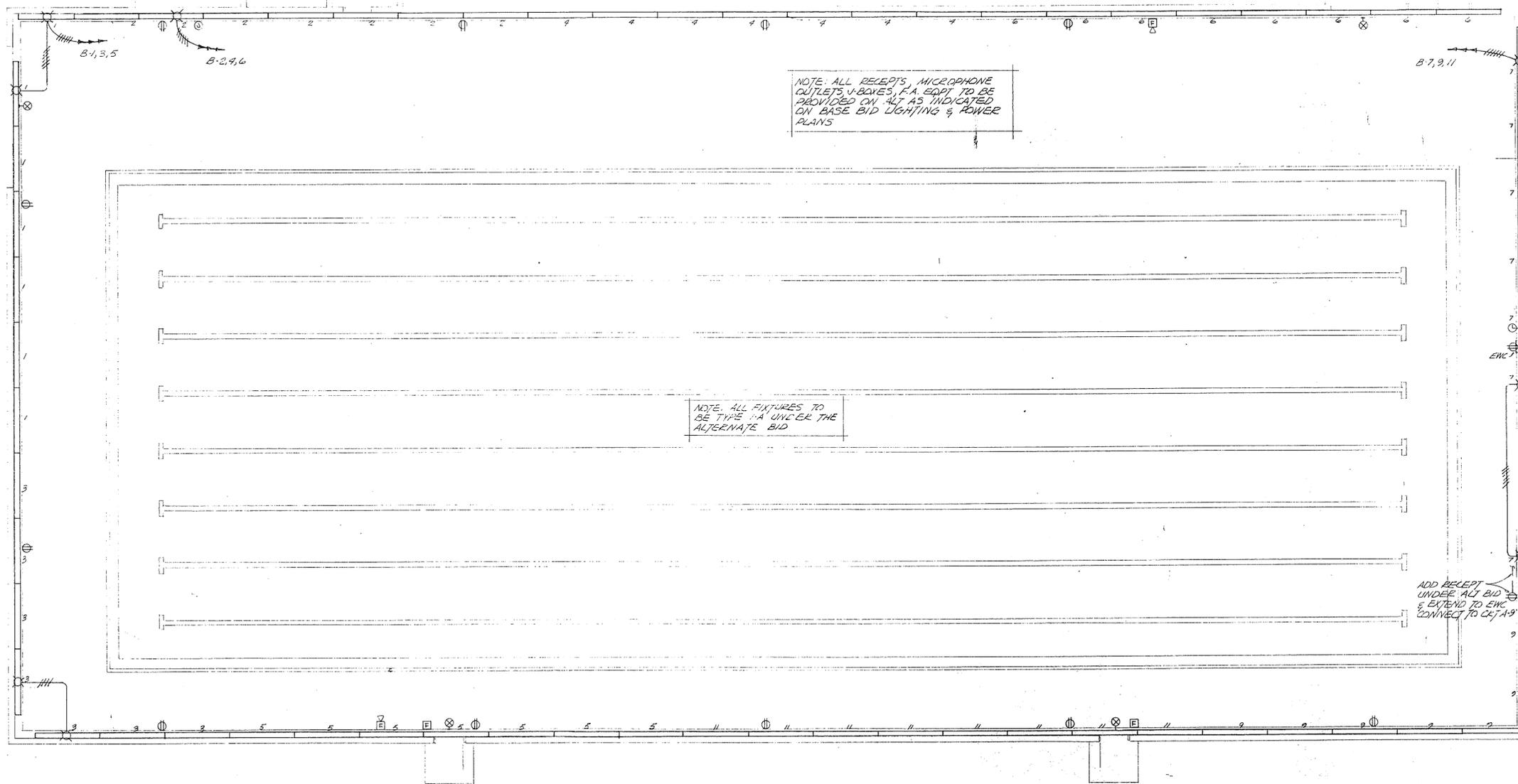


ENGINEER  
CITY OF BOZEMAN, MONTANA  
BOZEMAN MUNICIPAL POOL  
ELECTRICAL PLAN

OWNER  
PROJECT  
SHEET

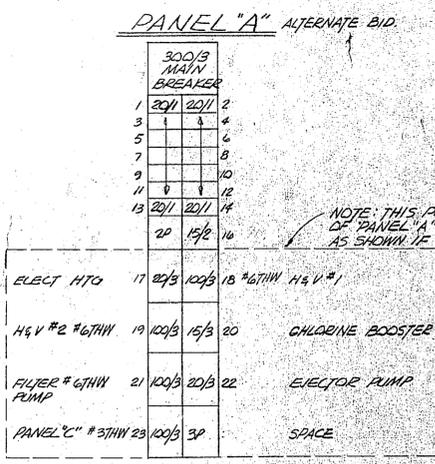
BERG GRABOW & PARTNERS  
ARCHITECTS-ENGINEERS-PLANNING CONSULTANTS  
bozeman montana

JOB NO. 7407  
DEC. 1974  
E-2  
OF 3

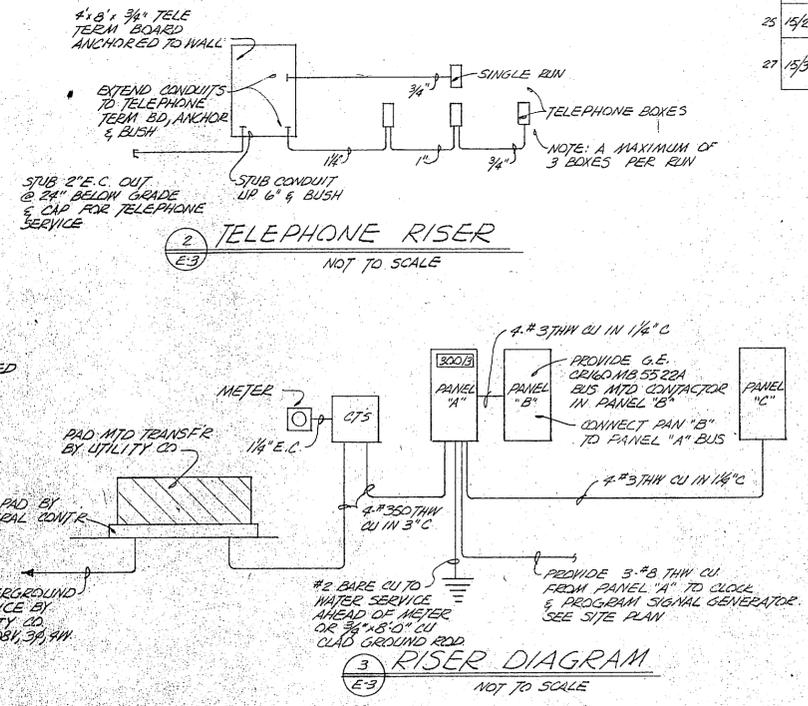


1 PARTIAL FLOOR PLAN - LIGHTING & POWER ALTERNATE BID  
SCALE: 1/8"=1'-0"

SCHEDULE OF CONTROL EQUIPMENT										
ROOM NO.	ITEMS FURNISHED BY MECH. CONTR.			ITEMS FURNISHED BY ELECTRICAL CONTRACTOR				AUXILIARY CONTROL EQUIPMENT FURNISHED BY MECH. CONTR. INSTALLED AND/OR CONNECTED BY ELECTRICAL CONTR.		REMARKS
	UNIT	HP	Q. VIS.	MFR. NO.	SIZE	PL.	R.B. SEL. SW.	PILOT		
ROOF	EF-1	1/4	1	120					TEMP. CONTROL	INTERLOCK 11 OIL-UMOC SW
ROOF	EF-2	1/4	1	120					TEMP. CONTROL	" " " " "
SHOWER	EF-3	1/4	1	120					TEMP. CONTROL	" " " " "
WDR. STOR.	EF-4	1/20	1	120					TEMP. CONTROL	" " " " "
MECH.	UNIT HTR.	1/45	1	120					TEMP. CONTROL	" " " " "
MECH.	IND. D. FAN #1	1/4	1	120					TEMP. CONTROL	" " " " "
MECH.	IND. D. FAN #2	1/20	1	120					TEMP. CONTROL	" " " " "
MECH.	IND. D. FAN #3	1/4	1	120					TEMP. CONTROL	CONNECT TO HTR HTR CONTROL PANEL
MECH.	IND. D. FAN #4	1/4	1	120					TEMP. CONTROL	" " " " "
MECH.	RECIRC. PUMP #1	1/2	1	120	GEORGINY			TOGGLE		" " " " "
ROOF	H&V #1	10	3	208					TEMP. CONTROL	H&V #1 & H&V #2 ARE 15 HP, 3 @ 208V ON ALTERNATE
ROOF	H&V #2	10	3	208					TEMP. CONTROL	" " " " "
MECH.	H&V #3	2	3	208					TEMP. CONTROL	" " " " "
MECH.	FILTER CIRC. PUMP	15	3	208	GEORGINY	3	9	U.A. 1000	POOL EQPT CONTR.	START STOP RUSH BUTTON IN COVER
MECH.	EJECTOR PUMP	3	3	208	GEORGINY	0	3	U.A. 1000	POOL EQPT CONTR.	START STOP RUSH BUTTON IN COVER
MECH.	CHLOR. BOOSTER PUMP	1	3	208	GEORGINY	0	3	U.A. 1000	POOL EQPT CONTR.	" " " " "
MECH.	AGITATOR MOTOR	1/8	1	120	GEORGINY			TOGGLE	POOL EQPT CONTR.	" " " " "



NOTE: CRY NOS. TO CHANGE ACCORDINGLY ON EQPT AS INDICATED ON PAN "A" ALT BID.



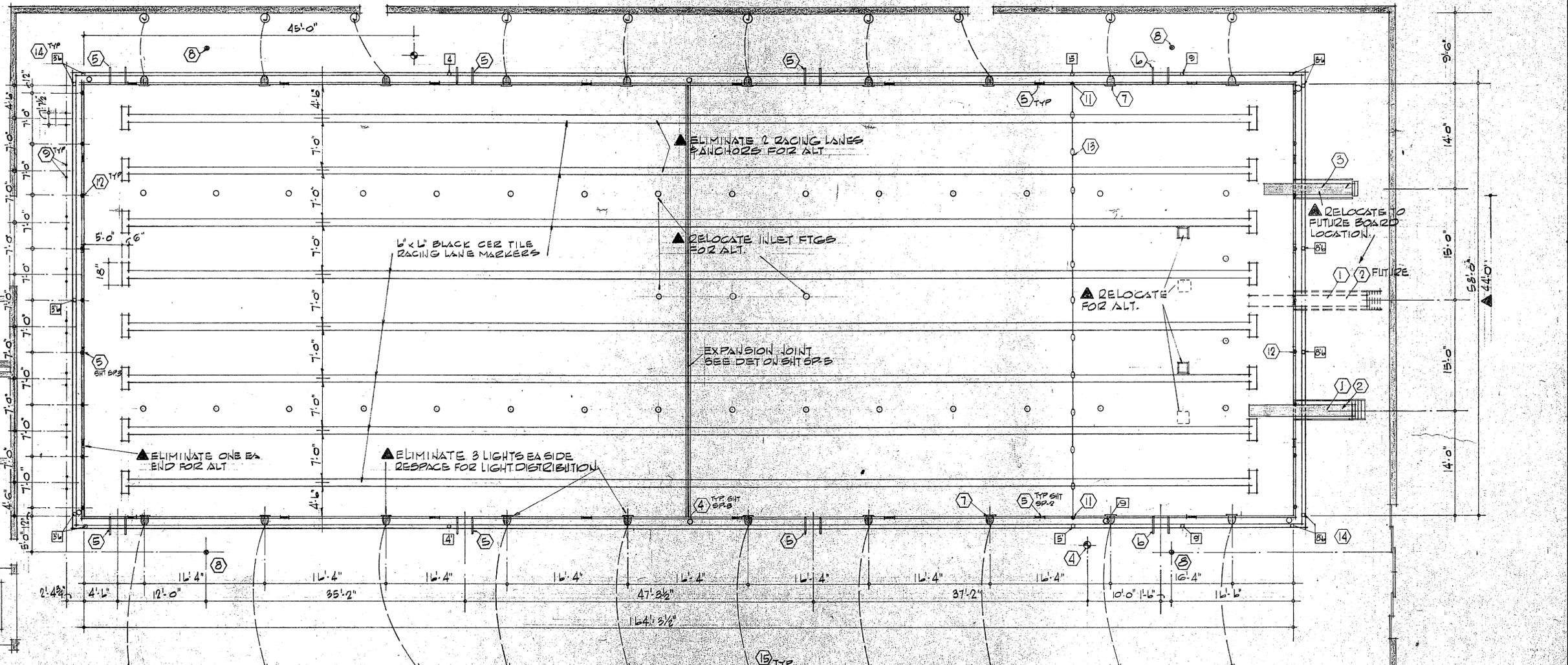
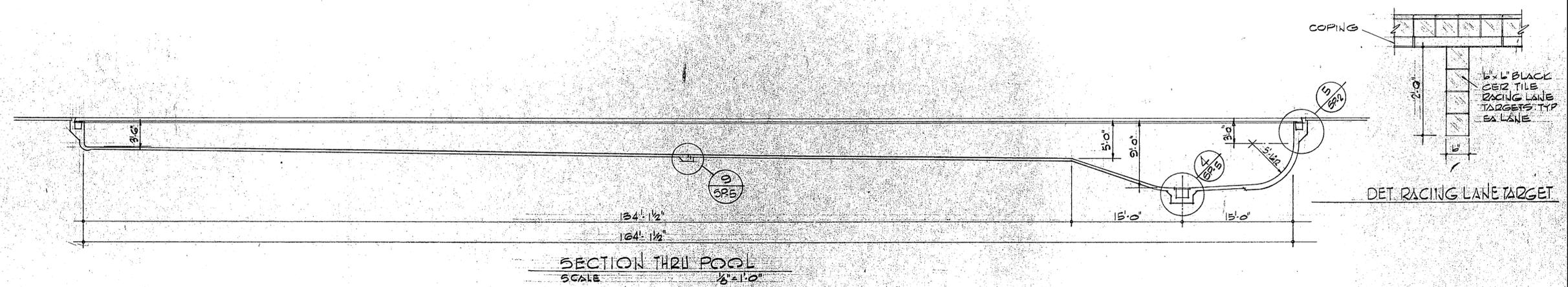
3 RISER DIAGRAM  
NOT TO SCALE

JOB NO. 7407  
 DEC. 1974  
 F-3  
 OF 3

ENGINEER  
 OWNER  
 PROJECT  
 SHEET

CITY OF BOZEMAN, MONTANA  
 BOZEMAN MUNICIPAL POOL  
 LIGHTING & POWER PLAN

BERG-GRAW & PARTNERS  
 ARCHITECTS-ENGINEERS-PLANNING CONSULTANTS  
 bozeman montana



**SWIMMING POOL DESIGN DATA**

POOL SIZE	58'-0" x 164'-3 1/2" (50 METERS)	▲ = 44'-0" WIDE
POOL DEPTH	5'-0" TO 9'-0"	
POOL PERIMETER	444'-6"	▲ 412'
POOL SURFACE AREA	9529 #	▲ 6,888 #
POOL VOLUME	324,000 GAL	▲ 254,000 GAL
TURN OVER RATE	925 GPM / 6 HOURS	▲ 725 GPM / 6 HR
FILTER RATE	1.84 GPM / # OF FILTER AREA	▲ 1.45 GPM / #
FILTER TYPE	VACUUM DE.	

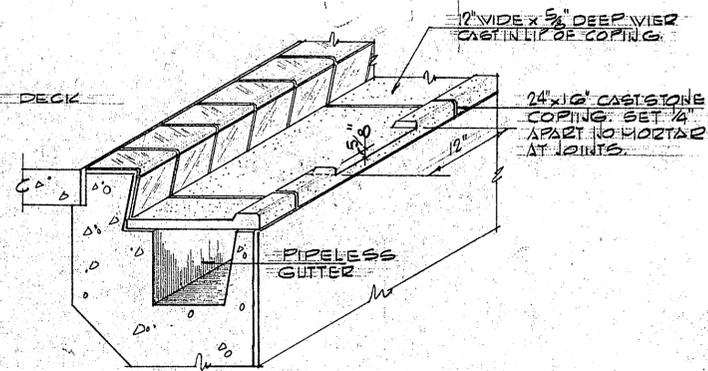
**POOL PLAN**  
 SCALE 1/8" = 1'-0"

▲ INDICATES ALTERNATE FOR REDUCTION OF POOL WIDTH TO 44'-0"

ENGINEER  
 SHEET NUMBER  
 DRAWING NUMBER  
 DETAIL KEY

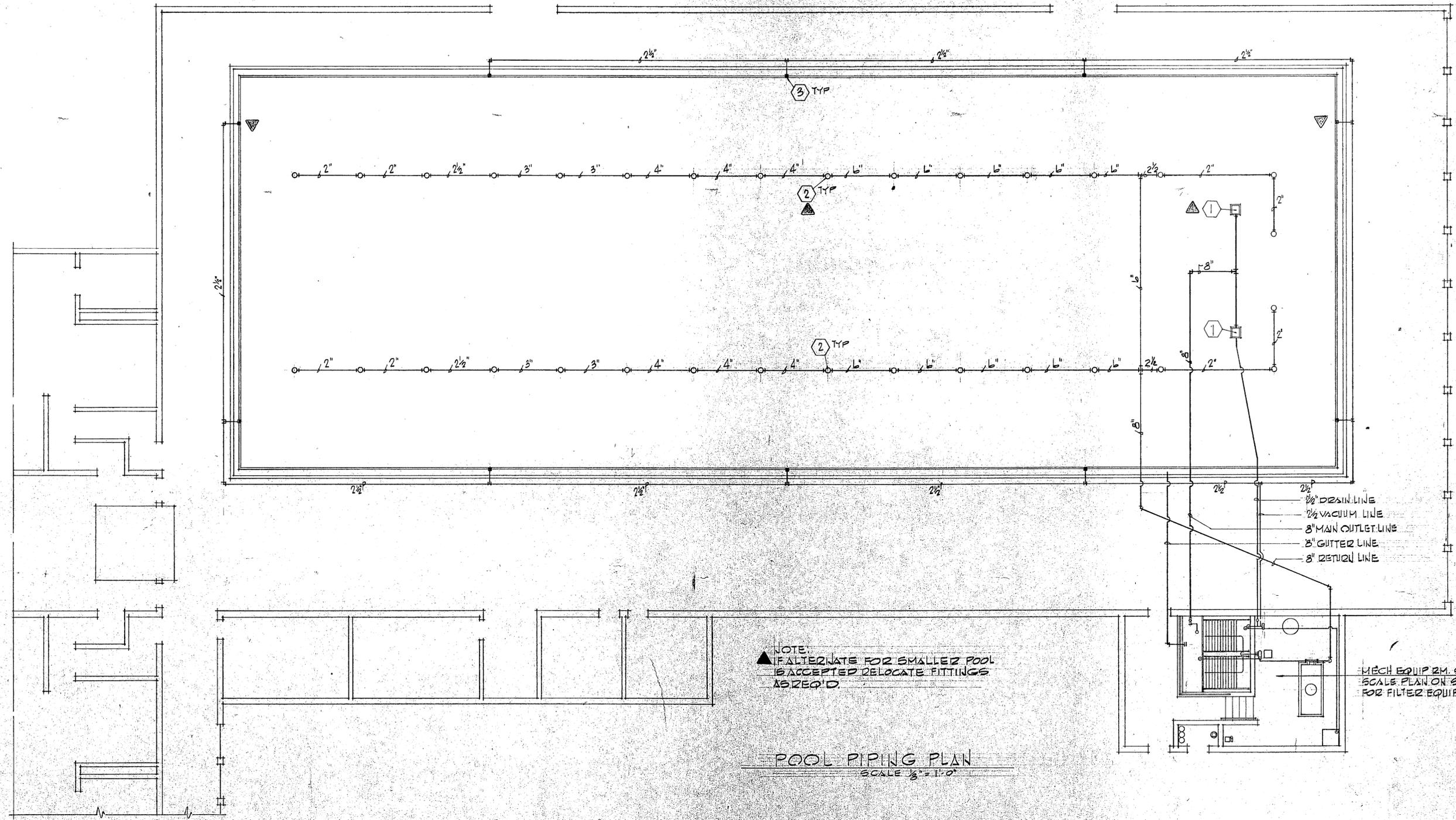
OWNER CITY OF BOZEMAN, MONTANA  
 PROJECT BOZEMAN MUNICIPAL POOL  
 SHEET SWIMMING POOL PLAN

**BERG-GRABOW & PARTNERS**  
 ARCHITECTS-ENGINEERS-PLANNING CONSULTANTS  
 bozeman montana



DET COPING SKIMMER WEIR ①

POOL FITTINGS					
MK.	DESCRIPTION	QUAN.	DET. NO.	MFR.	REMARKS
①	MAIN OUTLET GRATE & FRAME	2	④		FURNISHED & INSTALLED BY POOL CONTRACTOR
②	BOTTOM INLET FITTINGS	32	⑤		D.
③	VACUUM FITTINGS	10	⑥		D.
④	PIPELESS GUTTER CLEAN OUT COVERS - CAST IN COPING	7			D.
⑤	SKIMMER WEIRS BUILT IN LIP OF CASTSTONE COPING	21	①		D.
⑥	DECK DRAINS & PIPING				BY MECH CONTRACTOR SEE PLUMBING PLAN SHIT
⑦	EXPANSION JOINT				



NOTE:  
IF ALTERNATE FOR SMALLER POOL  
IS ACCEPTED RELOCATE FITTINGS  
AS REQ'D

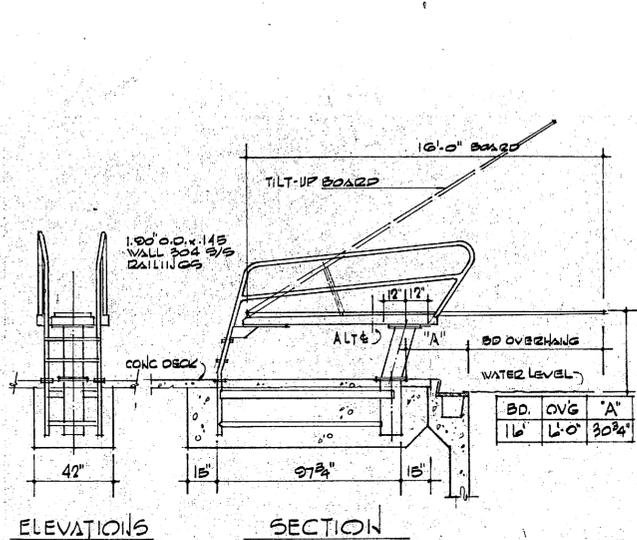
POOL PIPING PLAN  
SCALE 3/8" = 1'-0"

OBERG, 41, 206  
 W.E. Grabow - 300  
 P.A. Scarborough - 199  
 BOZEMAN, MONTANA  
 ARCHITECTS  
 STATE OF MONTANA  
 LICENSED

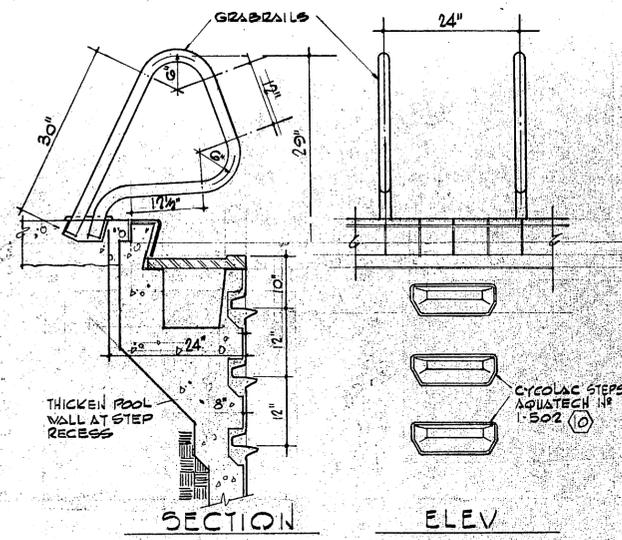
ENGINEER  
 OWNER CITY OF BOZEMAN, MONTANA  
 PROJECT BOZEMAN MUNICIPAL POOL  
 SHEET SWIMMING POOL - PIPING PLAN

BERG - GRABOW & PARTNERS  
 ARCHITECTS-ENGINEERS-PLANNING CONSULTANTS  
 bozeman montana

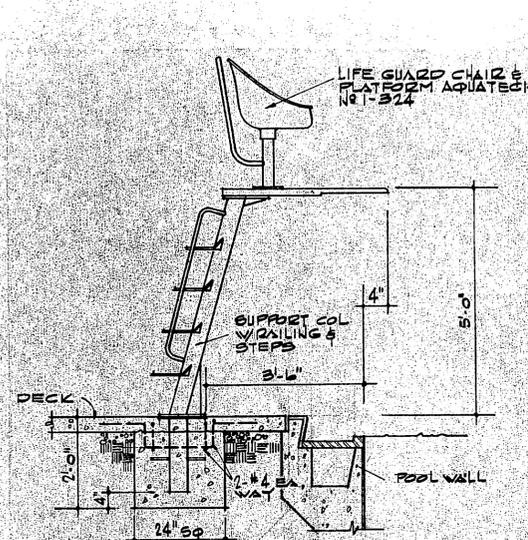
JOB NO. 7407  
 DEC. 1974  
 SP-3  
 of 5



DET ONE METER DIVING TOWER (1) SR2

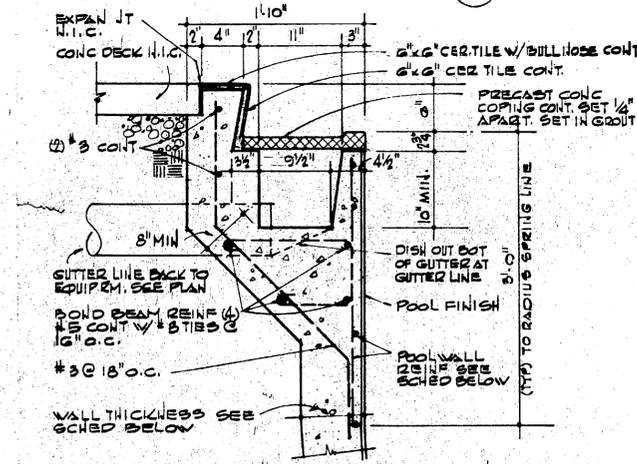


GRABRAIL DETAIL (2) SR2



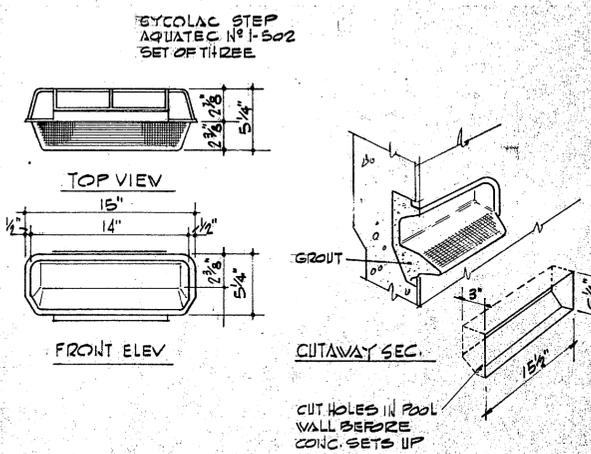
DET. LIFE GUARD CHAIR (3) SR2

POOL & DECK EQUIPMENT SCHED				
M.Q.	DESCRIPTION	QTY.	SET NO.	REMARKS
1	1/2 ALUMINUM DIVING BD.	1	(1) SR2	AQUATECH FURNISHED & INSTALLED BY POOL CONTRACTOR.
2	ONE METER CANTILEVERED DIVING TOWER	1	(1) SR2	D.
3	3/4 METER CANTILEVER TOWER W/ 1/2 ALUM. DIVING BOARD	1	(1) SR2	D.
4	LIFE GUARD CHAIR W/ CANTILEVERED TOWER	2	(2) SR2	D.
5	COMMERCIAL GRABRAILS W/ 3 RECESSED TREADS	6	(6) SR2	D.
6	COMMERCIAL GRABRAILS W/ 4 RECESSED TREADS	2	(2) SR2	D.
7	500 WATT UNDERWATER LIGHTS W/ LIGHT NICHE & CLEAR LENS	20	(20) SR2	D.
8	CASTSTONE STATION ANCHORS	4	(4) SR2	D.
9	STARTING PLATFORM DECK ANCHORS	16	(16) SR2	D.
10	CYCOLAC STEPS	26	(26) SR2	D.
11	LIFE LINE CUP ANCHORS	2	(2) SR2	D.
12	RACING LANE MARKER CUP ANCHORS	18	(18) SR2	D.
13	3/4\"/>			
14	CE2 TILE DEPTH MARKERS 4\"/>			
15	POOL LIGHT JUNG BOXES	20	(20) SR2	FURNISHED & INSTALLED BY ELECT CONTRACTOR.



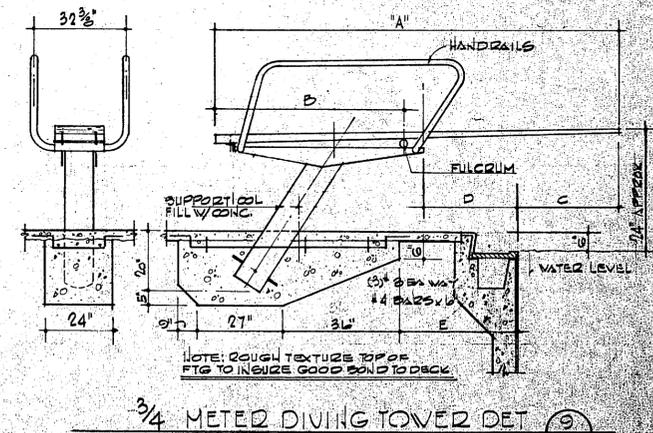
TYP SECTION THRU BOND BEAM & GUTTER (5) SR2

POOL GUNITE THICKNESS & REINFORCING SCHEDULE					
RADIUS	THICKNESS	FLOOR SLAB REINF.	VERT REINF SIZE	HORIZ REINF SIZE	SPACE
6\"/>					
2'-6\"/>					
4'-0\"/>					
4'-0\"/>					
5'-6\"/>					
7'-0\"/>					

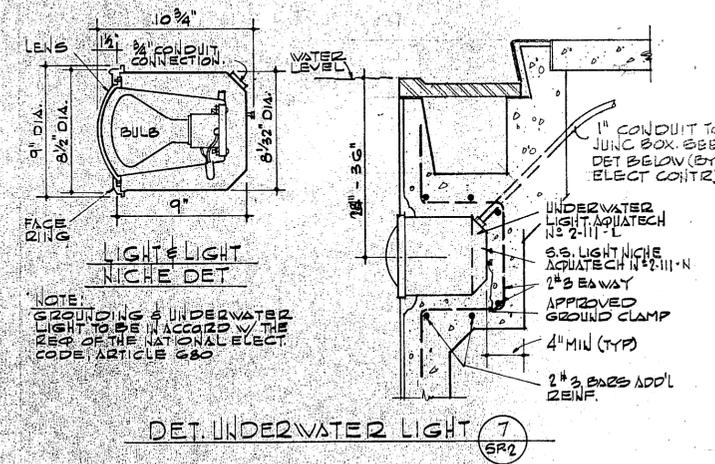


CYCOLAC STEP DETAIL (6) SR2

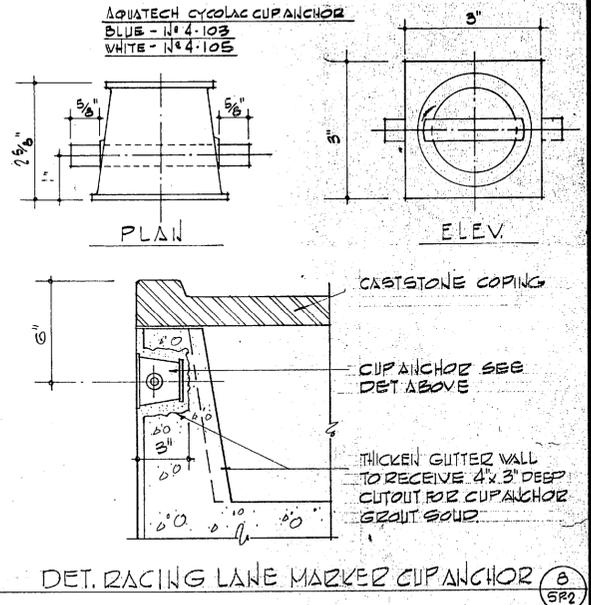
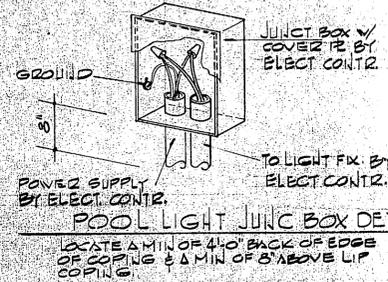
BOARD 'A'	B	C	D	E
12'-0"	35\"/>			



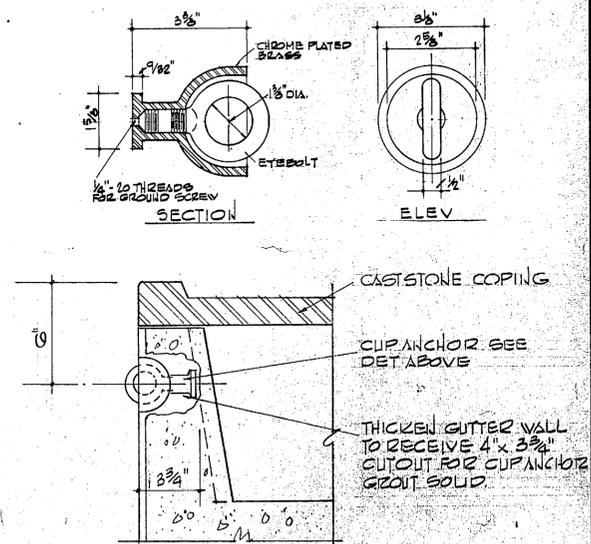
3/4 METER DIVING TOWER DET (9) SR2



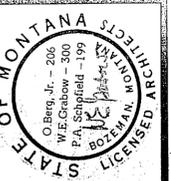
DET. UNDERWATER LIGHT (7) SR2



DET. RACING LANE MARKER CUP ANCHOR (8) SR2



DET LIFE LINE CUP ANCHOR (11) SR2

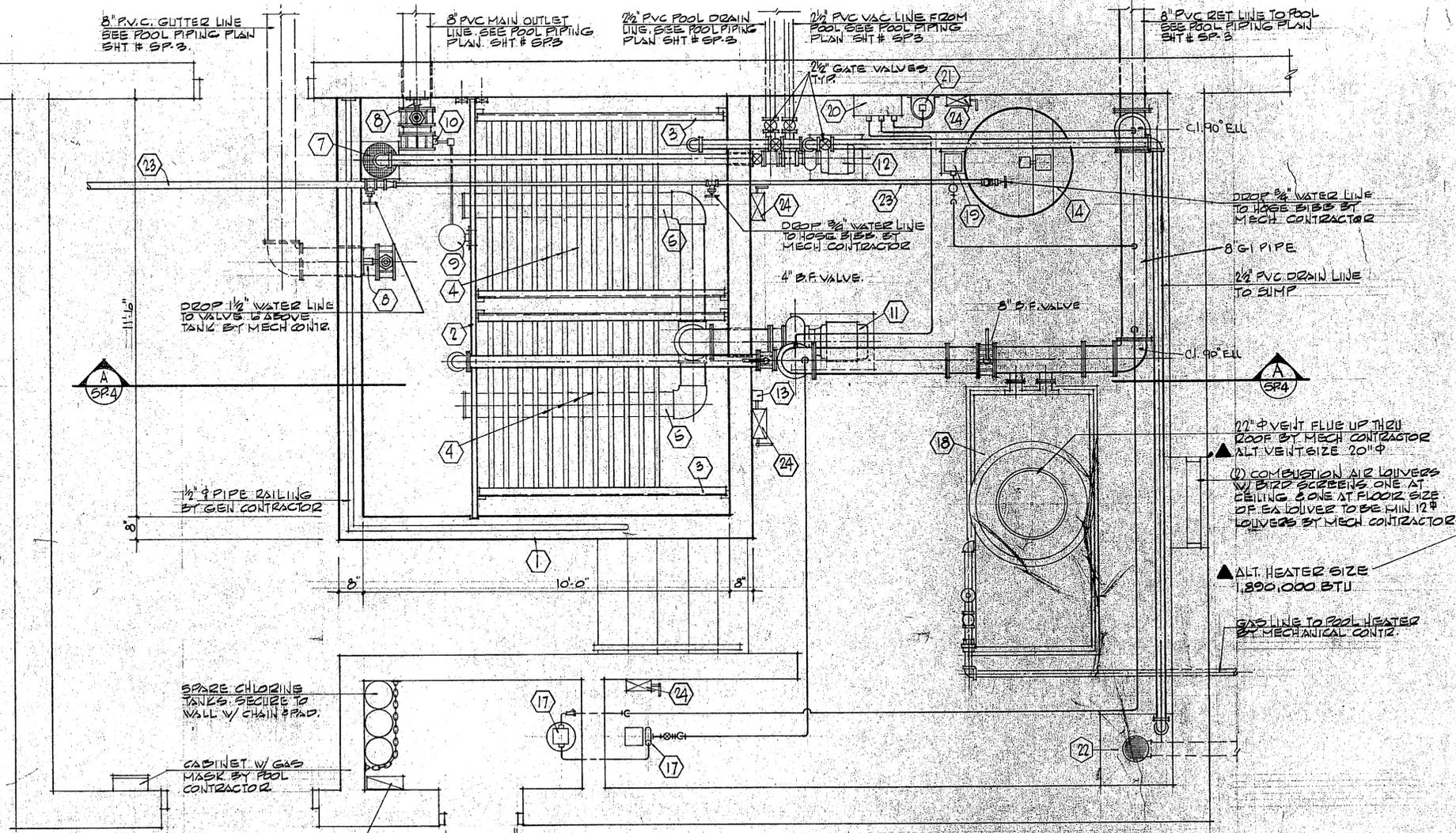


STATE OF MONTANA  
O. Berg, Jr. - 300  
W.E. Grabow - 300  
P.A. Schaffner - 199  
BOZEMAN, MONTANA  
LICENSED PROFESSIONAL ENGINEER

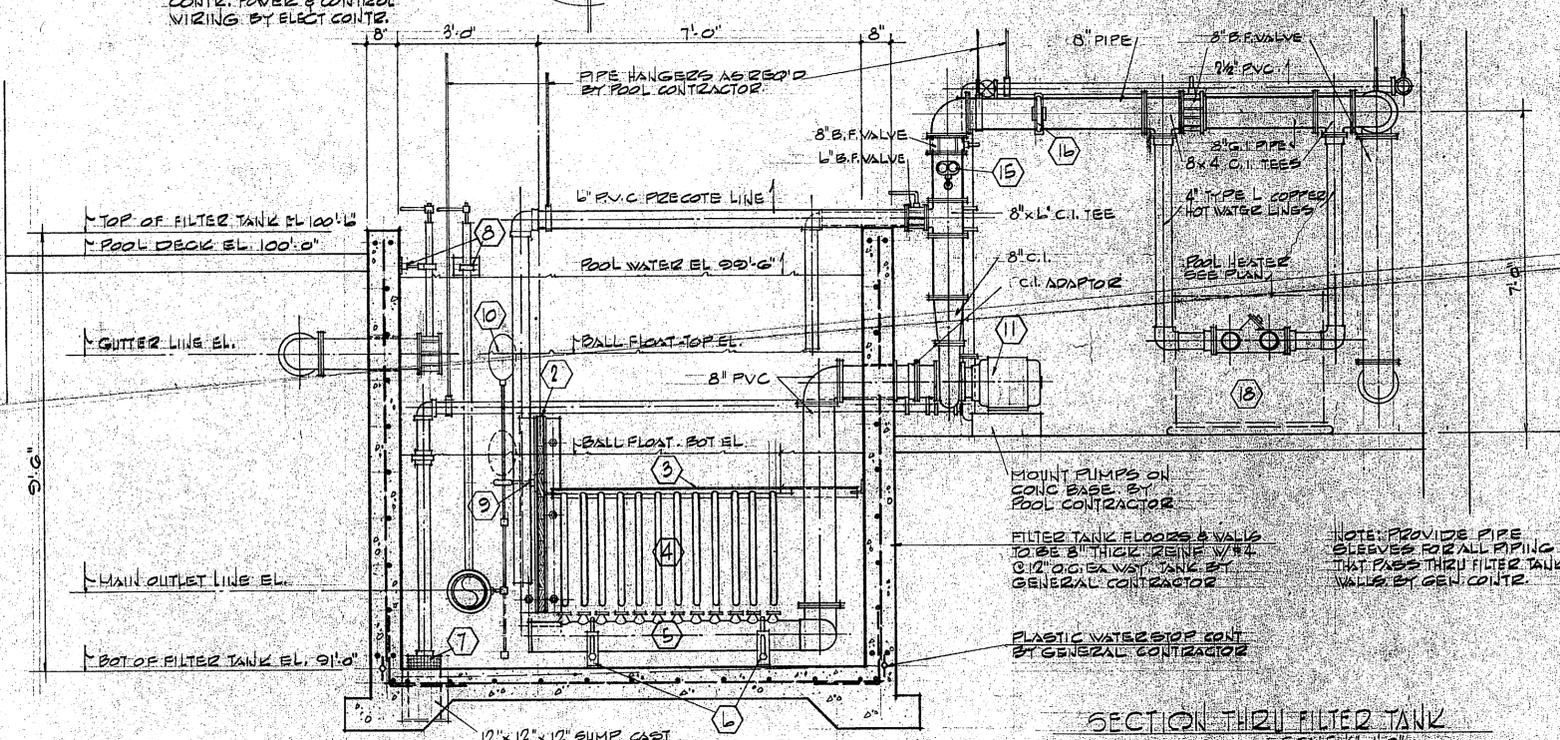
ENGINEER  
DRAWINGS MAY BE REPRODUCED FOR THE PROJECT ONLY. ALL MATERIALS AND METHODS SHALL BE INSTALLED ACCORDING TO THE SPECIFICATIONS AND DETAILS SHOWN ON THESE DRAWINGS. UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS SHALL BE IN INCHES.  
SHEET NUMBER  
DETAIL NUMBER  
Drawn By

OWNER: CITY OF BOZEMAN, MONTANA  
PROJECT: BOZEMAN MUNICIPAL POOL  
SHEET: SWIMMING POOL - DETAILS

BERG-GRABOW & PARTNERS  
ARCHITECTS-ENGINEERS-PLANNING CONSULTANTS  
bozeman montana

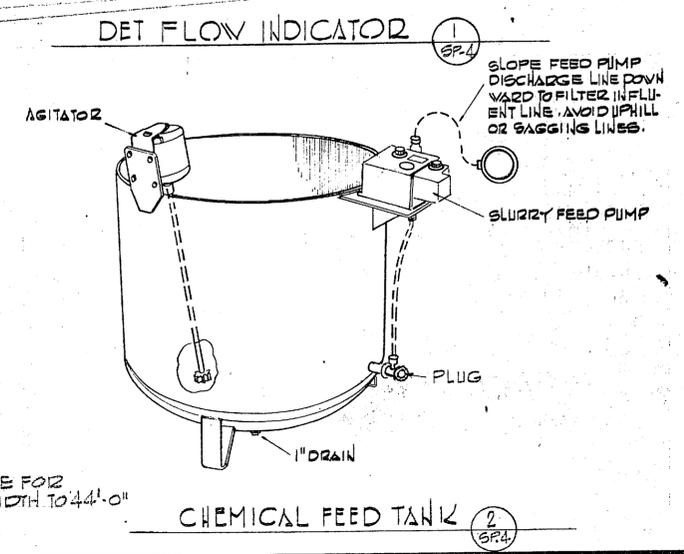
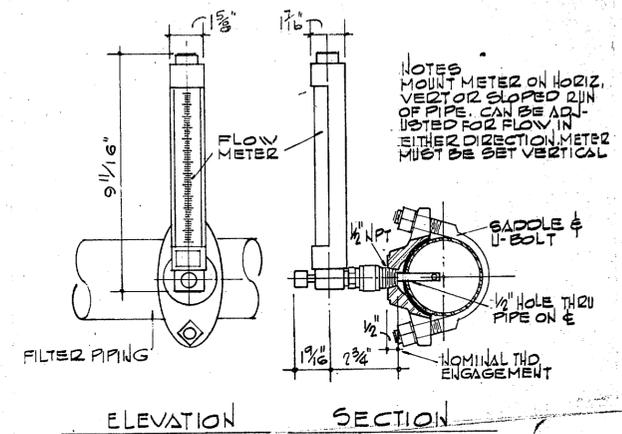


FILTERED EQUIPMENT ROOM PLAN  
SCALE 1/2" = 1'-0"



SECTION THRU FILTER TANK  
SCALE 1/2" = 1'-0"

FILTERED EQUIPMENT SCHED.					
NO.	DESCRIPTION	QUAN.	DET. NO.	MFR.	REMARKS
1	REINF CONC FILTER TANK SEE PLAN & SEC.	1	(2)		BY GENERAL CONTRACTOR
2	FILTER TANK BAFFLE & GUIDE CLEAR HEAT RESWOOD	1			BY GENERAL CONTRACTOR
3	FILTER ELEMENT HOLD DOWN BARS & ANCHOR CLIPS			AQUATECH	BY POOL CONTRACTOR
4	DIATOMACEOUS EARTH FILTER ELEMENTS - 30" x 120" ALT 20"	24		D.	D.
5	MANIFOLD HEADER	2	(7)	D.	D.
6	MANIFOLD HEADER SUPPORT BRACKETS	4	(8)	D.	D.
7	TRASH GUARD FOR EJECTOR PUMP SUCTION LINE.	1	(9)	AQUATECH	D.
8	VALVE STEM MOUNTING BRACKETS	2	(3)	D.	D.
9	BALL FLOAT STEM GUIDE BRACKETS	1	(2)	D.	D.
10	BALL FLOAT LINKAGE, FLOAT STEM & VALVES. BALL FLOATS TO BE 3"	1		D.	D.
11	FILTER CIRC PUMP 20 HP ALT PUMP SIZE 15 HP	1		PACO	D.
12	EJECTOR PUMP 3 HP	1		MARLOW	D.
13	ADJUSTABLE MERCROID VACUUM SWITCH	1		MERCROID	D.
14	CHEM. FEEDER W/ 30" TANK VAGITATOR MIXER	1	(1)	AQUATECH	D.
15	VACUUM & PRESSURE GAUGE PANEL	1		AQUATECH	D.
16	FLOWMETER	1	(1)	FISCHER PORTER	D.
17	TANK MOUNTED CHLORINATOR 1 HP BOOSTER PUMP	1		FISCHER PORTER	D.
18	POOL HEATER - GAS FIRED A-F 2450 - 2,450,000 BTU	1		LAARS	GAS PIPING BY MECH CONTR. CONTROL WIRING BY ELECT CONTR.
19	SODA ASH FEED PUMP	1	(2)	PRECISION	BY POOL CONTRACTOR
20	CHEMICAL CONTROL SYSTEM	1		STRANTRON	D.
21	ACID FEED PUMP W/ ACID FEED TANK	1		PRECISION	D.
22	BACKWASH SUMP DRAIN & LINE TO WASTE SIZE FOR 200 GPM				SUMP BY GEN. CONTRACTOR DRAIN BY MECH CONTR.
23	FRESH WATER PIPING & VALVES TO FILTER TANK & CHEM TANK				BY MECH CONTRACTOR
24	MAG. STARTERS POWER & CONTROL WIRING FOR ALL MOTORS				BY ELECTRICAL CONTRACTOR



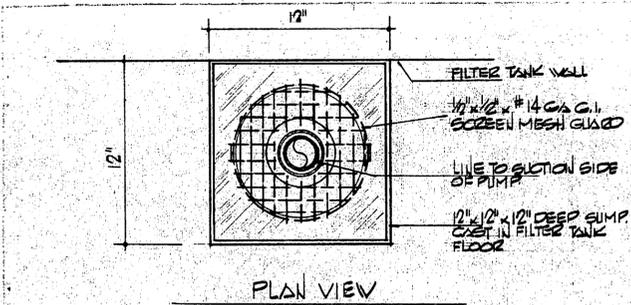
CHEMICAL FEED TANK (2) (SRA)

JOB NO. 7407  
 DEC. 1974  
 OF 5

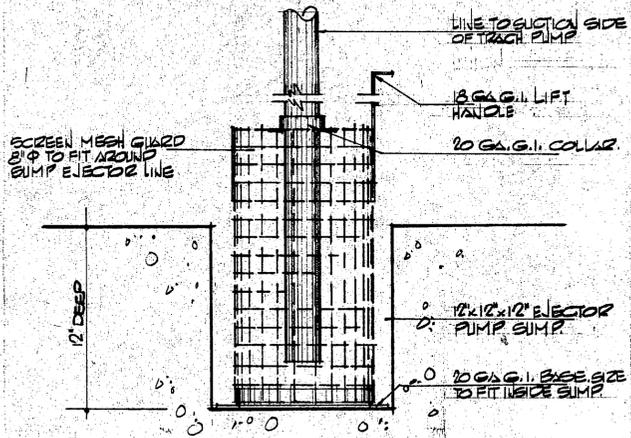
**BERG-GRABOW & PARTNERS**  
 ARCHITECTS-ENGINEERS-PLANNING CONSULTANTS  
 bozeman montana

OWNER: CITY OF BOZEMAN, MONTANA  
 PROJECT: BOZEMAN MUNICIPAL POOL  
 SHEET: SWIMMING POOL - EQUIPMENT

ENGINEER: [Signature]  
 STATE OF MONTANA LICENSE NO. 199  
 BOZEMAN, MONTANA

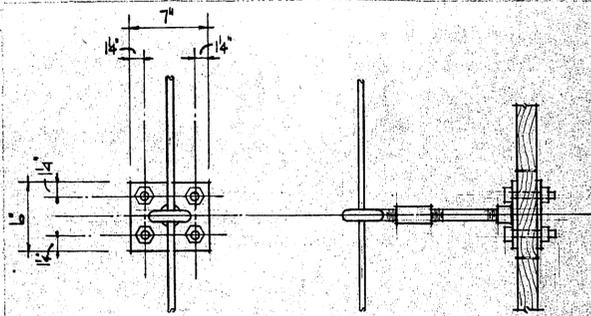


PLAN VIEW

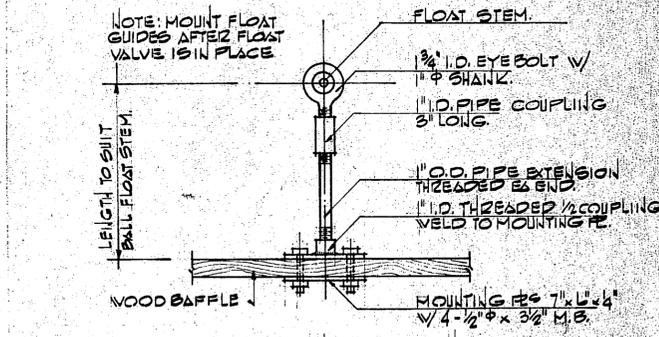


SECTION

1 DET. TRASH GUARD FOR EJECTOR SUMP

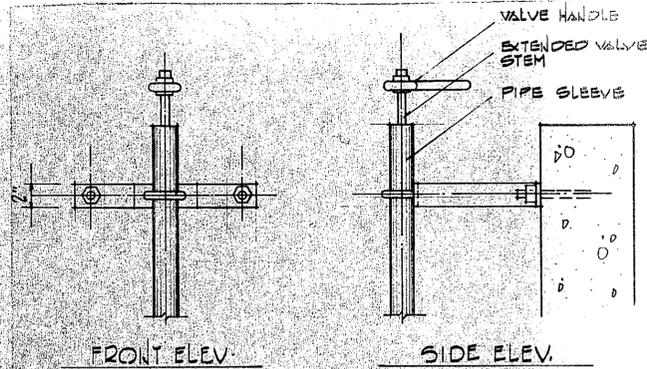


FRONT ELEV. SIDE ELEV.

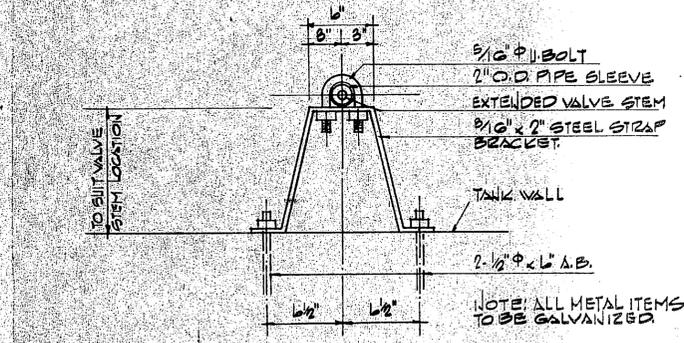


PLAN VIEW

2 BALL FLOAT STEM SUPPORT BRACKET

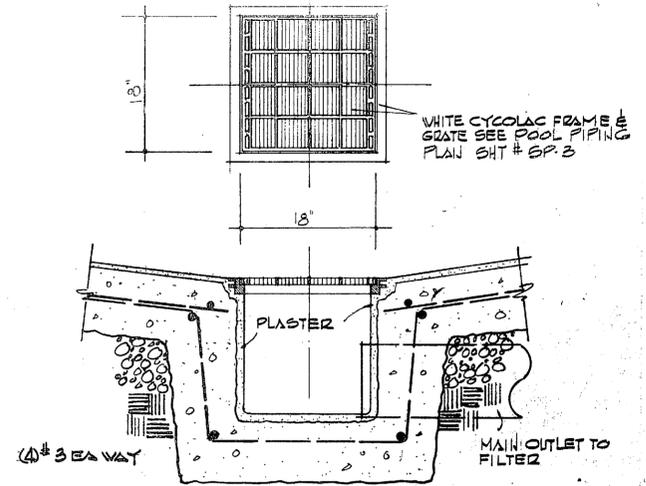


FRONT ELEV. SIDE ELEV.

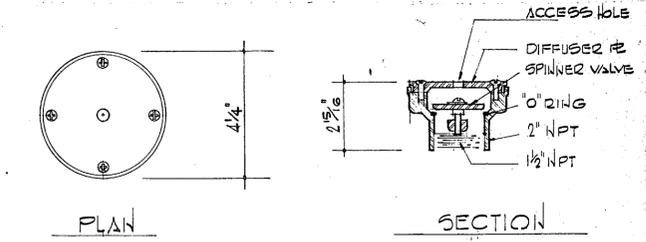


PLAN VIEW

3 VALVE STEM MOUNTING BRACKET DET.

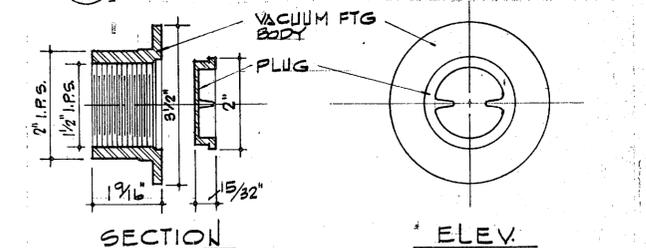


4 DET. SQUARE FRAME & GRATE

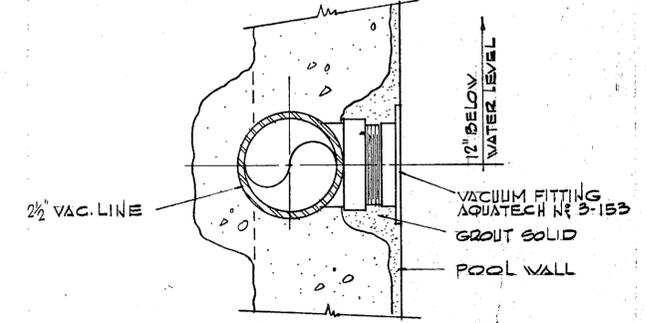


PLAN SECTION

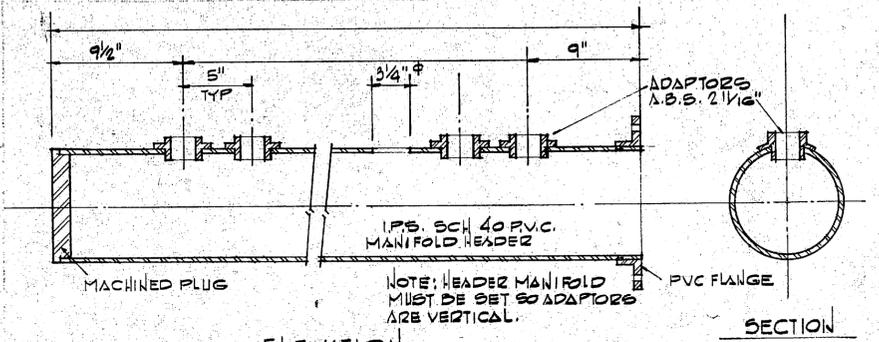
5 DET. FLOOR INLET FITTING



SECTION ELEV.

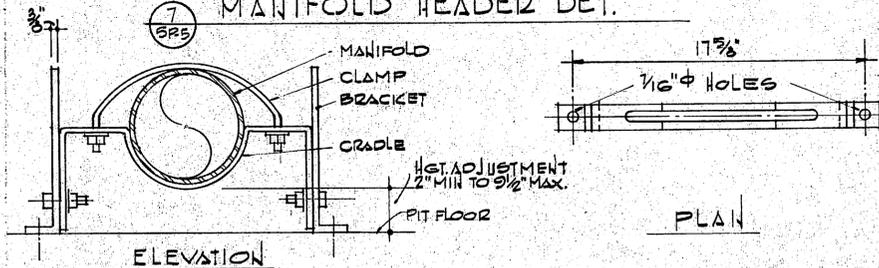


6 DET. VACUUM FITTING



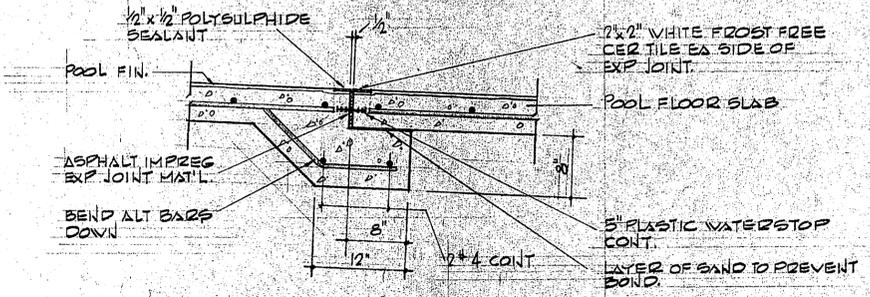
ELEVATION SECTION

7 MANIFOLD HEADER DET.



ELEVATION PLAN

8 MANIFOLD SUPPORT DET.



9 EXPANSION JOINT DET.



ENGINEER  
 SHEET NUMBER  
 DETAIL NUMBER  
 SCALE 1/8\"/>

OWNER CITY OF BOZEMAN, MONTANA  
 PROJECT BOZEMAN MUNICIPAL POOL  
 SHEET SWIMMING POOL - DETAILS & SECTIONS

**BERG-GRABOW & PARTNERS**  
 ARCHITECTS-ENGINEERS-PLANNING CONSULTANTS  
 bozeman montana

JOB NO. 7407  
 DEC. 1974  
 SP-5  
 OF 5

# Technical Memorandum and Tier 1 Seismic Evaluation for the

## City of Bozeman's **Swim Center**

1211 W Main St.  
Bozeman, MT 59715

Reported to:

Mike Gray, Facilities Superintendent  
Max Ziegler, Facilities Project Coordinator

Prepared by:



Morrison-Maierle, Inc.  
Project #: 0417.091

Rebecca Scheetz, PE  
Austin Batson, EI  
Jay Fischer, PE

April-May 2022

## BACKGROUND

Constructed in 1974, the ~29,000 sq-ft Swim Center is owned and maintained by the City of Bozeman and serves as an indoor aquatic center serving the Bozeman community. The Swim Center consists of a filter room, locker rooms, an entryway, and the natatorium. The Swim Center is attached to the Bozeman High School by a corridor and adjacent offices. Reference the Structural Construction Documents prepared by “Hulbut-Kersich-Mccullough” for the City of Bozeman in 1974 (Appendix C) for the full plan set.

Like many buildings designed and built prior to the adoption of the 1976 Uniform Building Code (UBC), the Swim Center was not necessarily explicitly designed to resist the lateral forces induced by the horizontal ground accelerations associated with earthquakes. The building codes governing in the early 1970’s gave designers the option to apply several prescriptive recommendations related to lateral force resistance but did not require engineers to design for the effects on building performance. Over the past 40 years, the poor performance of these pre-seismic design structures during large earthquakes has been well-documented, and updates have been made to building codes to address identified deficiencies.

The most common and efficient method for evaluating an existing structure for potential seismic hazards related to building safety and performance is to perform an ASCE 41-17 Seismic Evaluation of Existing Buildings - Tier 1 Seismic Evaluation. This screening procedure uses multiple checklists to provide a basic summary of potential seismic hazards and/or building deficiencies. The Tier 1 Seismic Evaluation screening procedure is intended to be used to quickly assess existing buildings and identify potential seismic-related issues or hazards that may require further investigation or verification.

Tier 1 Seismic Evaluation checklists are a function of the following two factors: 1) the building site’s *Level of Seismicity*, and 2) the *Level of Performance* of the building during a seismic event. The level of seismicity – defined as either low, moderate, or high - is a factor of the mapped response accelerations (i.e. ground accelerations during an earthquake) for a given site. Based on the response accelerations mapped at the Swim Center, the level of seismicity for the site is considered **high**.

The Swim Center is classified as a Risk Category III structure. Based on the Swim Center’s size, location, proximity to the Bozeman High School, and use, the Swim Center’s structural systems, components and connections were evaluated at both the *Immediate Occupancy* and *Life Safety* performance levels. The *Immediate Occupancy* performance level is more restrictive than the *Life Safety* performance level, and is defined by ASCE 41-17 as “the post-earthquake damage state in which a structure remains safe to occupy and essentially retains its pre-earthquake strength and stiffness.” The *Life Safety* performance level is defined by ASCE 41-17 as “the post-earthquake damage state in which a structure has damaged structural components but retains a margin of safety against the onset of partial or total collapse.” Similarly, the Swim Center’s nonstructural components and systems were evaluated at both the *Position Retention* and *Hazards Reduced* performance levels. ASCE 41-17 defines the *Position Retention* performance level as “the post-earthquake state in which nonstructural components might be damaged to the extent that they cannot immediately function but are secured in place so that damage caused by falling, toppling, or breaking of utility connections is avoided.” The *Hazards Reduced* performance level is defined as “the post-earthquake state in which nonstructural components are damaged and could potentially create falling hazards, but high-hazard nonstructural components are secure to prevent falling into areas of public assembly of those falling hazards from those components

could pose a risk to life safety for many people.” The performance levels are evaluated against different spectral response acceleration parameters, which are the BSE-2E (5%/50-year) and BSE-1E (20%/50-year) for *Life Safety / Position Retention* and *Immediately Occupancy / Hazards Reduced* performance levels respectively. Based on the site-specific spectral response acceleration parameters, building-type-specific factors and project-specific building performance objectives, the *Life Safety / Position Retention / BSE-2E* (20%/50-year) requirements and parameters control.

## EXISTING STRUCTURAL SYSTEM REVIEW

Through a review of the existing building plans provided by the City of Bozeman and observations made during visits to the facility, the following is our description of the existing facility’s structural systems and the structural considerations that need to be taken into account for continued use of the space.

The existing structure was built in 1974 and consists of reinforced masonry bearing / shear walls supporting wooden roof framing. The structural foundations for the Swim Center are reinforced concrete grade beams that span between buried concrete piers bearing on reinforced concrete spread footings. The floor system consists of a four-inch-thick slab-on-grade with welded wire fabric used throughout for reinforcement.

The building’s main structural roof framing systems can be categorized into four areas: main entry way/locker rooms, filter room, staff office/high school corridor, and the natatorium. See Figures 1 and 2.

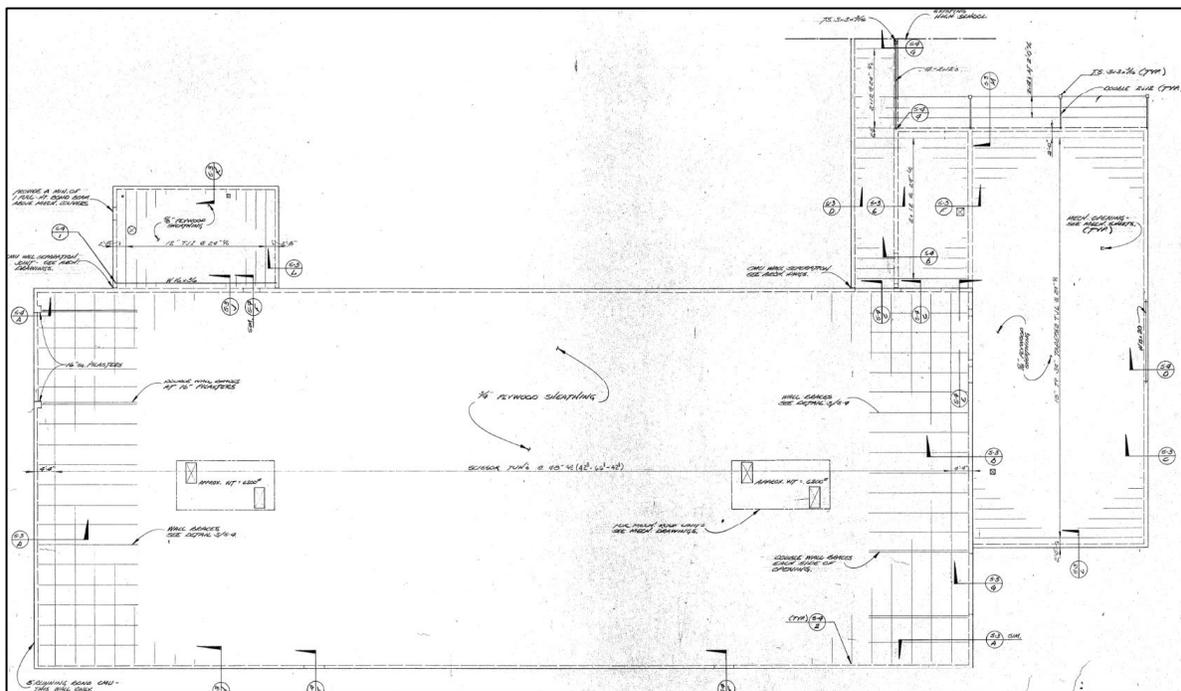


Figure 1: Roof Framing Plan (1974 Plans)



*Figure 2: Looking west from Bozeman High School at the Swim Center roof*

The roof framing system over the entry way and locker rooms consists of plywood over open-web wood trusses with steel webbing at 2'-0" on center, and the roof framing system over the filter room is of plywood decking over 12" TJI joists at 2'-0" on center. The roof framing at the staff offices and corridor connecting the Swim Center to the Bozeman High School is plywood decking over rough sawn 2x12 rafters at 2'-0" on center. The natatorium roof is framed with structural insulated panels roof panels over long-span open-web wood scissor TJH trusses at 4'-0" on center.

After reviewing the facility and the existing drawings, we have determined that the primary lateral system is classified as **RM1**, which is defined as follows:

*“Reinforced Masonry Bearing Walls with Flexible Diaphragms, RM1 – These buildings have bearing walls that consist of reinforced brick or concrete block masonry. The floor and roof framing consists of steel or wood beams and girders, cold-formed steel light-framed construction, or open web joists and are supported by steel, wood, or masonry columns. Seismic forces are resisted by the reinforced brick or concrete block masonry shear walls. Diaphragms consist of straight or diagonal wood sheathing, plywood, or untopped metal deck and are flexible relative to the walls. The foundation is permitted to consist of a variety of elements.”*

The nonstructural components of the building were evaluated against the Position Retention performance level using the Non-Structural checklist. Please note that MMI did not explicitly evaluate every non-structural component. Where access was limited, only representative non-structural components were evaluated, but it is reasonable to extrapolate related finding to other nonstructural components of similar type, construction, and age.

## **FINDINGS**

Based on the screening requirements provided in ASCE 41-17, a full Tier 1 Seismic Evaluation of the Swim Center was performed. Using information collected during multiple site visits, coupled with the original design drawings, four Tier 1 checklists were completed. The checklists (Appendix A) served to evaluate the structural systems and connections, geologic site and building foundations. “Compliant” statements identify conditions that are likely acceptable. “Non-Compliant” or “Unknown” statements identify potential seismic deficiencies that need further investigation through a more thorough documentation of as-constructed conditions and / or more detailed structural analyses.

All checklist items identified as “Non-Compliant” or “Unknown” have been listed in the following table. The following table summarizes the identified structural deficiencies / unknowns based on the visual observation of the existing structural elements and the structural analysis performed during the ASCE 41-17 “Quick Checks”, and corresponding proposed measures necessary to verify these items and / or bring them into compliance with the noted performance objectives.

<b>#</b>	<b>Checklist</b>	<b>Checklist Deficiency / Unknown</b>	<b>Structural Deficiency Category</b>	<b>Structural Mitigation Action / Proposed Measures</b>
1	IO Basic	Load Path	The detailed connections in the original 1974 Construction Documents appear to have a complete, well-defined load path sufficient to transfer and resist lateral forces. However, discrepancies between the existing construction documents provided and the in-place structural elements and connections were discovered in the Natatorium (Fig 3-4). There are also locations that lack positive connections to transfer the lateral loads in the filter room. Additionally, several locations, including the natatorium, locker rooms, entry way, offices and corridor could not be verified for compliance with the Construction Documents, nor was their current condition able to be evaluated, due to the presence of spray foam insulation (Fig 5).	Contractor shall remove spray foam insulation and verify that all (or a representative sample) of the structural elements have positive connection sufficient to transfer and resist lateral forces.  In the absence of positive structural connections, contractor shall provide post-installed ledgers, sills, anchorage, nailing and other attachments as required.
2	IO Basic	Adjacent Buildings	The Swim Center and Bozeman High School are attached via a corridor and office space.	Verify that there is a seismic joint that creates adequate separation at the wall and roof levels between the existing Swim Center and the existing Bozeman High School.  Verify that the seismic joint is adequately sized to allow the adjacent structures to move freely and independently during an earthquake.

#	Checklist	Checklist Deficiency / Unknown	Structural Deficiency Category	Structural Mitigation Action / Proposed Measures
3	RM1	Wall Anchorage	<p>In several locations, including the natatorium, locker rooms, entry way, offices and corridor, the connection elements could not be verified for compliance with the Construction Documents, nor was their current condition able to be evaluated, due to the presence of spray foam insulation (Fig 5).</p> <p>In the filter room, shims were used to build up the top of wall to support the roof. These locations lack a positive connection to transfer lateral load from the roof diaphragm to the walls (Fig 6).</p>	<p>Contractor shall remove spray foam insulation and verify that all (or a representative sample) of the structural elements have positive connection sufficient to transfer and resist lateral forces.</p> <p>In the absence of positive structural connections, contractor shall provide post-installed ledgers, sills, anchorage, nailing and other attachments as required.</p>
4	RM1	Wood Ledgers		
5	RM1	Transfer to Shearwalls		
6	RM1	Stiffness of Wall Anchors		
7	RM1	Plan Irregularities		
8	RM1	Cross Ties		
9	NS	-	<p>It is unknown how / if life safety systems, hazardous materials, partitions, ceilings, light fixtures, cladding and glazing, canopies, contents, appendages, mechanical and electrical equipment, piping and ducts are adequately supported.</p>	<p>Owner shall hire a contractor, an electrical engineer and a mechanical engineer to review the existing building systems and drawings to assess the nonstructural systems.</p> <p>Contractor shall provide all required bracing, support and coupling for all nonstructural elements and systems within and affixed to the building structure.</p>



Figure 3: Natatorium roof framing connection at west CMU bearing wall

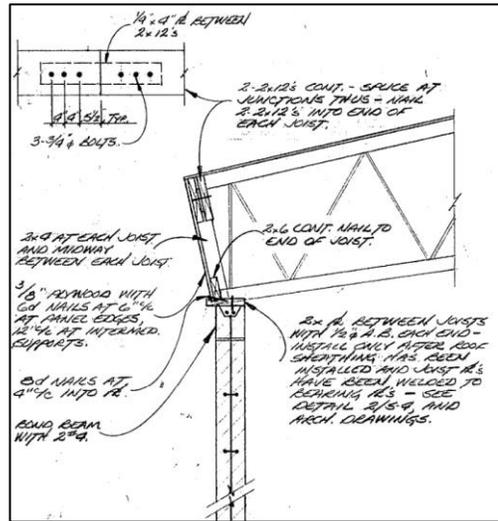


Figure 4: Natatorium roof framing connection to bearing walls per the 1974 Construction Documents

As seen in Figures 3 and 5, the top of the CMU bearing wall extends to the roofline, and the top chords of the trusses appear to bear in pockets at the top of the CMU bearing wall. Figure 4 is a detail from the original construction documents which shows the CMU bearing wall stopping at the bottom chord of the open-web trusses and the bottom chord of the open-web trusses bearing on the top of the CMU wall. A similar discrepancy between the [existing](#) structural elements and connections and the [provided](#) construction documents was observed at the end wall (north and south wall) conditions.



Figure 5: Natatorium roof framing connection at west CMU bearing wall, connections obstructed by spray foam insulation



Figure 6: Lack of a positive connection to transfer lateral load from the roof diaphragm to the walls at the filter room

## CONCLUSIONS

Many of the non-compliant and / or unknown items identified in the checklists are related to the structural load path and connections. Though the connections in the original 1974 Construction Documents appear to have a complete, well-defined load path sufficient to transfer and resist lateral forces, there were discrepancies between the existing Construction Documents provided and the top of wall conditions observed at all four of the CMU walls at the perimeter of the natatorium. Additionally, the top of wall connections at the filter room appear to lack positive connections to transfer the lateral loads. Further, the presence of spray foam insulation throughout prevented the visual assessment of the connections in several locations, including the natatorium, locker rooms, entry way, offices and corridor. These connections were not able to be verified for compliance with the Construction Documents, nor was their current condition able to be evaluated. See the photos in Appendix B for reference.

It also could not be confirmed that a seismic joint exists to separate the Swim Center from the adjacent Bozeman High School. A seismic joint in this location is important because the separation between the two structures allows for the adjacent structures to move freely and independently during an earthquake without one structure inadvertently adding load to the adjacent structure's lateral elements. We recommend it be confirmed with further investigation if a seismic joint exists in this location.

It is our opinion that the lack of a positive connection at the top of the wall in the filter room was the most [apparent](#) non-compliant issue observed. Positive connections are an essential component of a continuous load path, and without positive connections the lateral elements', in this case CMU shearwalls', ability to resist lateral forces is greatly diminished. This condition may be an isolated issue in the filter room and may not be present in other areas of the building, however we recommend it be confirmed with further investigation and documentation that this construction method was not used throughout the building at the natatorium, locker rooms, entry way, offices and corridor connections.

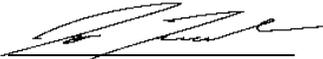
Based on our findings in the filter room, the Bozeman Swim Center is not compliant with the ASCE 41-17 Tier 1 requirements for the *Immediate Occupancy* performance level at BSE-1E, nor the *Life Safety* performance level at BSE-2E. Moreover, there are widespread load-path and connection-related unknowns throughout the remainder of the building that are concerning from a structural standpoint. It should also be noted that the non-compliant and unknown structural items identified are similarly concerning at the ASCE 41-17 *Collapse Prevention* performance level. [Additionally](#), the nonstructural components within and affixed to the building structure could not be confirmed compliant with the ASCE 41-17 requirements for a *Position Retention* performance level at BSE-1E nor a *Hazards Reduced* performance level at BSE-2E.

As mentioned, the Tier 1 Seismic Evaluation screening procedure is intended to be used to quickly assess existing buildings and identify potential seismic-related issues or hazards that may require further investigation or verification. It is important to distinguish that the many of the items noted, with the exception of the lack of positive connection at the top of wall in the filter room, are not [categorized as](#) "deficiencies," but rather items that could not be verified by our engineers within the scope of this evaluation. Excluding the lack of a positive connection at the top of wall in the filter room, each of noted areas that could not be verified (the connections at the natatorium, locker rooms, entry way, offices, corridor, and the connection to the Bozeman High School) will require through a more thorough documentation of the as-constructed conditions and / or a more detailed structural analyses to determine if they have adequate structural capacity to transfer and resist the inertial forces associated with seismic loading conditions.

**LIMITATIONS**

*Our discussions and opinions expressed verbally and in the summary information above does not express nor imply any warranty or guarantee of the existing conditions and is limited to the directed areas of focus and structural elements that were observable at the time of these efforts. There is no claim, neither stated nor implied, that all faulty conditions were or could be determined based on the limited scope of our efforts. We are available to continue investigations that will provide more detail on the conditions and measures necessary to address any damage or deficiencies.*

Morrison-Maierle, Inc.



Jay Fischer, PE



Rebecca Scheetz, PE



Austin Batson, EI

**Attachments:**

*Appendix A: Tier 1 Seismic Evaluation Checklists (21 pages)*

*Appendix B: Swim Center Tier 1 Seismic Evaluation Photos (8 pages)*

*Appendix C: Swim Center Original Construction Documents from 1974 (29 pages)*

## ASCE 41-17 Tier 1 Checklists

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FIRM:	Morrison-Maierle
PROJECT NAME:	City of Bozeman - Swim Center
SEISMICITY LEVEL:	High
PROJECT NUMBER:	0417.091
COMPLETED BY:	RLS / AMB
DATE COMPLETED:	04/29/2022
REVIEWED BY:	JBF / BDA
REVIEW DATE:	04/25/2022

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

## Appendix C: Summary Data Sheet

### BUILDING DATA

Building Name: Bozeman Swim Center Date: 04/29/2022  
 Building Address: 1211 W Main St. Bozeman, MT 59715  
 Latitude: 45.68002 Longitude: -111.05435 By: RLS / AMB  
 Year Built: 1974 Year(s) Remodeled: 1987, 2019 Original Design Code: \_\_\_\_\_  
 Area [ft<sup>2</sup> (m<sup>2</sup>):] 29000 sq ft Length [ft (m)]: 224' Width [ft (m)]: 108'  
 No. of Stories: 1 Story Height: varies Total Height: ~28' (max. at ridge)

USE  Industrial  Office  Warehouse  Hospital  Residential  Educational  Other: community  
 concrete tie beams spanning between piers / spread footings

### CONSTRUCTION DATA

Gravity Load Structural System: wood roof framing supported by reinforced CMU bearing / shear walls  
 Exterior Transverse Walls: reinforced CMU Openings? yes  
 Exterior Longitudinal Walls: reinforced CMU Openings? yes  
 Roof Materials/Framing: wood decking over 2x rafters, 12" TJI, open web wood trusses  
 Intermediate Floors/Framing: N/A  
 Ground Floor: 4" slab on grade with 6x6 welded wire fabric  
 Columns: 16" square pilasters Foundation: concrete tie beams spanning between piers on spread footings  
 General Condition of Structure: fair  
 Levels Below Grade? N/A  
 Special Features and Comments: N/A

### LATERAL-FORCE-RESISTING SYSTEM

	Longitudinal	Transverse
System:	<u>CMU bearing / shear walls</u>	<u>CMU bearing / shear walls</u>
Vertical Elements:	<u>CMU bearing / shear walls</u>	<u>CMU bearing / shear walls</u>
Diaphragms:	<u>wood sheathing / SIPs</u>	<u>wood sheathing / SIPs</u>
Connections:	_____	_____

### EVALUATION DATA

BSE-2E Spectral Response Accelerations:  $S_{DS} =$  0.698g  $S_{D1} =$  0.353g  
 Soil Factors: Class = D  $F_a =$  1.401  $F_r =$  2.292  
 BSE-1E Spectral Response Accelerations:  $S_{AS} =$  0.359  $S_{A1} =$  0.17  
 Level of Seismicity: high Performance Level: Life Safety (controls)  
 Building Period:  $T =$  0.243s  
 Spectral Acceleration:  $S_s =$  1.409g  
 Modification Factor:  $C =$  1.0 Building Weight:  $W =$  6630k  
 Pseudolateral Force:  $V =$  9342k  
 $C_{s,W} =$  \_\_\_\_\_

BUILDING CLASSIFICATION: Risk Category III

### REQUIRED TIER 1 CHECKLISTS

	Yes	No
Basic Configuration Checklist	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Building Type <u>RM1</u> Structural Checklist	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Nonstructural Component Checklist	<input checked="" type="checkbox"/>	<input type="checkbox"/>

FURTHER EVALUATION REQUIREMENT: \_\_\_\_\_

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

# ASCE 41-17 Tier 1 Checklists

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FIRM:	Morrison-Maierle
PROJECT NAME:	City of Bozeman - Swim Center
SEISMICITY LEVEL:	High
PROJECT NUMBER:	0417.091
COMPLETED BY:	RLS / AMB
DATE COMPLETED:	04/29/2022
REVIEWED BY:	JBF / BDA
REVIEW DATE:	04/25/2022

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

## 17.1.2IO Basic Configuration Checklist

**Table 17-3. Immediate Occupancy Basic Configuration Checklist**

Status				Evaluation Statement	Tier 2 Reference	Commentary Reference	Comments
<b>Very Low Seismicity</b>							
<b>Building System—General</b>							
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	LOAD PATH: The structure contains a complete, well-defined load path, including structural elements and connections, that serves to transfer the inertial forces associated with the mass of all elements of the building to the foundation.	5.4.1.1	A.2.1.1	The detailed connections in the original 1974 Construction Documents appear to have a complete, well-defined load path sufficient to transfer and resist lateral forces. However discrepancies between the existing construction documents provided and the in-place structural elements and connections were discovered in the natatorium. There are also locations that lack positive connections to transfer the lateral loads in the filter room. Additionally, several locations could not be verified for compliance with the Construction Documents, nor was their current condition able to be evaluated, due to the presence of spray foam insulation.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	ADJACENT BUILDINGS: The clear distance between the building being evaluated and any adjacent building is greater than 0.5% of the height of the shorter building in low seismicity, 1.0% in moderate seismicity, and 3.0% in high seismicity.	5.4.1.2	A.2.1.2	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	MEZZANINES: Interior mezzanine levels are braced independently from the main structure or are anchored to the seismic-force-resisting elements of the main structure.	5.4.1.3	A.2.1.3	
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
<b>Building System—Building Configuration</b>							
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	WEAK STORY: The sum of the shear strengths of the seismic-force-resisting system in any story in each direction is not less than 80% of the strength in the adjacent story above.	5.4.2.1	A.2.2.2	
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	SOFT STORY: The stiffness of the seismic-force-resisting system in any story is not less than 70% of the seismic-force-resisting system stiffness in an adjacent story above or less than 80% of the average seismic-force-resisting system stiffness of the three stories above.	5.4.2.2	A.2.2.3	
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	VERTICAL IRREGULARITIES: All vertical elements in the seismic-force-resisting system are continuous to the foundation.	5.4.2.3	A.2.2.4	
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

<b>C</b> <input type="checkbox"/>	<b>NC</b> <input type="checkbox"/>	<b>N/A</b> <input checked="" type="checkbox"/>	<b>U</b> <input type="checkbox"/>	GEOMETRY: There are no changes in the net horizontal dimension of the seismic-force-resisting system of more than 30% in a story relative to adjacent stories, excluding one-story penthouses and mezzanines.	5.4.2.4	A.2.2.5
<b>C</b> <input type="checkbox"/>	<b>NC</b> <input type="checkbox"/>	<b>N/A</b> <input checked="" type="checkbox"/>	<b>U</b> <input type="checkbox"/>	MASS: There is no change in effective mass of more than 50% from one story to the next. Light roofs, penthouses, and mezzanines need not be considered.	5.4.2.5	A.2.2.6
<b>C</b> <input checked="" type="checkbox"/>	<b>NC</b> <input type="checkbox"/>	<b>N/A</b> <input type="checkbox"/>	<b>U</b> <input type="checkbox"/>	TORSION: The estimated distance between the story center of mass and the story center of rigidity is less than 20% of the building width in either plan dimension.	5.4.2.6	A.2.2.7

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference	Comments
<b>Low Seismicity (Complete the Following Items in Addition to the Items for Very Low Seismicity)</b>				
<b>Geologic Site Hazards</b>				
<b>C</b> <input checked="" type="checkbox"/>	<b>NC</b> <input type="checkbox"/>	<b>N/A</b> <input type="checkbox"/>	<b>U</b> <input type="checkbox"/>	LIQUEFACTION: Liquefaction-susceptible, saturated, loose granular soils that could jeopardize the building's seismic performance do not exist in the foundation soils at depths within 50 ft (15.2 m) under the building.
<b>C</b> <input checked="" type="checkbox"/>	<b>NC</b> <input type="checkbox"/>	<b>N/A</b> <input type="checkbox"/>	<b>U</b> <input type="checkbox"/>	SLOPE FAILURE: The building site is located away from potential earthquake-induced slope failures or rockfalls so that it is unaffected by such failures or is capable of accommodating any predicted movements without failure.
<b>C</b> <input checked="" type="checkbox"/>	<b>NC</b> <input type="checkbox"/>	<b>N/A</b> <input type="checkbox"/>	<b>U</b> <input type="checkbox"/>	SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site are not anticipated.

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

Status				Evaluation Statement	Tier 2 Reference	Commentary Reference	Comments
<b>Moderate and High Seismicity (Complete the Following Items in Addition to the Items for Low Seismicity)</b>							
<b>Foundation Configuration</b>							
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	OVERTURNING: The ratio of the least horizontal dimension of the seismic-force-resisting system at the foundation level to the building height (base/height) is greater than $0.6S_a$ .	5.4.3.3	A.6.2.1	Sa = 0.502
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	TIES BETWEEN FOUNDATION ELEMENTS: The foundation has ties adequate to resist seismic forces where footings, piles, and piers are not restrained by beams, slabs, or soils classified as Site Class A, B, or C.	5.4.3.4	A.6.2.2	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

## ASCE 41-17 Tier 1 Checklists

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FIRM:	Morrison-Maierle
PROJECT NAME:	City of Bozeman - Swim Center
SEISMICITY LEVEL:	High
PROJECT NUMBER:	0417.091
COMPLETED BY:	RLS / AMB
DATE COMPLETED:	04/29/2022
REVIEWED BY:	JBF / BDA
REVIEW DATE:	04/25/2022

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

## 17.1710 Structural Checklist for Building Types RM1: Reinforced Masonry Bearing Walls with Flexible Diaphragms and RM2: Reinforced Masonry Bearing Walls with Stiff Diaphragms

Table 17-35. Immediate Occupancy Structural Checklist for Building Types RM1 and RM2

Status				Evaluation Statement	Tier 2 Reference	Commentary Reference	Comments
<b>Very Low Seismicity</b>							
<b>Seismic-Force-Resisting System</b>							
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	REDUNDANCY: The number of lines of shear walls in each principal direction is greater than or equal to 2.	5.5.1.1	A.3.2.1.1	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	SHEAR STRESS CHECK: The shear stress in the reinforced masonry shear walls, calculated using the Quick Check procedure of Section 4.4.3.3, is less than 70 lb/in. <sup>2</sup> (4.83 MPa).	5.5.3.1.1	A.3.2.4.1	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	REINFORCING STEEL: The total vertical and horizontal reinforcing steel ratio in reinforced masonry walls is greater than 0.002 of the wall with the minimum of 0.0007 in either of the two directions; the spacing of reinforcing steel is less than 48 in., and all vertical bars extend to the top of the walls.	5.5.3.1.3	A.3.2.4.2	Dur-o-wall horizontals at 16" o.c.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
<b>Connections</b>							
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	WALL ANCHORAGE: Exterior concrete or masonry walls that are dependent on the diaphragm for lateral support are anchored for out-of-plane forces at each diaphragm level with steel anchors, reinforcing dowels, or straps that are developed into the diaphragm. Connections have strength to resist the connection force calculated in the Quick Check procedure of Section 4.4.3.7.	5.7.1.1	A.5.1.1	The detailed connections in the original 1974 Construction Documents appear to have a complete, well-defined load path sufficient to transfer and resist lateral forces. However discrepancies between the existing construction documents provided and the in-place structural elements and connections were discovered in the natatorium. There are also locations that lack positive connections to transfer the lateral loads in the filter room. Additionally, several locations could not be verified for compliance with the Construction Documents, nor was their current condition able to be evaluated, due to the presence of spray foam insulation. (1)
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	WOOD LEDGERS: The connection between the wall panels and the diaphragm does not induce cross-grain bending or tension in the wood ledgers.	5.7.1.3	A.5.1.2	(1)
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	TRANSFER TO SHEAR WALLS: Diaphragms are connected for transfer of seismic forces to the shear walls, and the connections are able to develop the lesser of the shear strength of the walls or diaphragms.	5.7.2	A.5.2.1	(1)
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	FOUNDATION DOWELS: Wall reinforcement is doweled into the foundation, and the dowels are able to develop the lesser of the strength of the walls or the uplift capacity of the foundation.	5.7.3.4	A.5.3.5
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	GIRDER-COLUMN CONNECTION: There is a positive connection using plates, connection hardware, or straps between the girder and the column support.	5.7.4.1	A.5.4.1
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
<b>Stiff Diaphragms</b>						
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	TOPPING SLAB: Precast concrete diaphragm elements are interconnected by a continuous reinforced concrete topping slab.	5.6.4	A.4.5.1
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	TOPPING SLAB TO WALLS OR FRAMES: Reinforced concrete topping slabs that interconnect the precast concrete diaphragm elements are doweled for transfer of forces into the shear wall or frame elements.	5.7.2	A.5.2.3
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
<b>Foundation System</b>						
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	DEEP FOUNDATIONS: Piles and piers are capable of transferring the lateral forces between the structure and the soil.		A.6.2.3
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	SLOPING SITES: The difference in foundation embedment depth from one side of the building to another does not exceed one story.		A.6.2.4
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
<b>Status</b>	<b>Evaluation Statement</b>			<b>Tier 2 Reference</b>	<b>Commentary Reference</b>	<b>Comments</b>
<b>Low, Moderate, and High Seismicity (Complete the Following Items in Addition to the Items for Very Low Seismicity)</b>						
<b>Seismic-Force-Resisting System</b>						
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	REINFORCING AT WALL OPENINGS: All wall openings that interrupt rebar have trim reinforcing on all sides.	5.5.3.1.5	A.3.2.4.3
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	PROPORTIONS: The height-to-thickness ratio of the shear walls at each story is less than 30.	5.5.3.1.2	A.3.2.4.4
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
<b>Diaphragms (Stiff or Flexible)</b>						
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls are less than 15% of the wall length.	5.6.1.3	A.4.1.4
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			

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<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	OPENINGS AT EXTERIOR MASONRY SHEAR WALLS: Diaphragm openings immediately adjacent to exterior masonry shear walls are not greater than 4 ft (1.2 m) long.	5.6.1.3	A.4.1.6	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	PLAN IRREGULARITIES: There is tensile capacity to develop the strength of the diaphragm at reentrant corners or other locations of plan irregularities.	5.6.1.4	A.4.1.7	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>				
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	DIAPHRAGM REINFORCEMENT AT OPENINGS: There is reinforcing around all diaphragm openings larger than 50% of the building width in either major plan dimension.	5.6.1.5	A.4.1.8	
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
<b>Flexible Diaphragms</b>							
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	CROSS TIES: There are continuous cross ties between diaphragm chords.	5.6.1.2	A.4.1.2	Several connections, including the connection of the cross ties to the TOW in the natatorium, locker rooms, entry way, offices and corridor, could not be verified for proper installation, nor was their current condition able to be evaluated, due to the presence of spray foam insulation. (1)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>				
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	STRAIGHT SHEATHING: All straight-sheathed diaphragms have aspect ratios less than 1-to-1 in the direction being considered.	5.6.2	A.4.2.1	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	SPANS: All wood diaphragms with spans greater than 12 ft (3.6 m) consist of wood structural panels or diagonal sheathing.	5.6.2	A.4.2.2	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 30 ft (9.2 m) and aspect ratios less than or equal to 3-to-1.	5.6.2	A.4.2.3	
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	NONCONCRETE FILLED DIAPHRAGMS: Untopped metal deck diaphragms or metal deck diaphragms with fill other than concrete consist of horizontal spans of less than 40 ft (12.2 m) and have aspect ratios less than 4-to-1.	5.6.3	A.4.3.1	
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	OTHER DIAPHRAGMS: Diaphragms do not consist of a system other than wood, metal deck, concrete, or horizontal bracing.	5.6.5	A.4.7.1	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
<b>Connections</b>							
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	STIFFNESS OF WALL ANCHORS: Anchors of concrete or masonry walls to wood structural elements are installed taut and are stiff enough to limit the relative movement between the wall and the diaphragm to no greater than 1/8 in. before engagement of the anchors.	5.7.1.2	A.5.1.4	Several connections, including wall anchorage connections in the natatorium, locker rooms, entry way, offices and corridor, could not be verified for proper installation, nor was their current condition able to be evaluated, due to the presence of spray foam insulation. (1)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>				

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# ASCE 41-17 Tier 1 Checklists

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FIRM:	Morrison-Maierle
PROJECT NAME:	City of Bozeman - Swim Center
SEISMICITY LEVEL:	High
PROJECT NUMBER:	0417.091
COMPLETED BY:	RLS / AMB
DATE COMPLETED:	04/29/2022
REVIEWED BY:	JBF / BDA
REVIEW DATE:	04/25/2022

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## 17.19 Nonstructural Checklist

Table 17-38. Nonstructural Checklist

Status				Evaluation Statement <sup>a,b</sup>	Tier 2 Reference	Commentary Reference	Comments
<b>Life Safety Systems</b>							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>HR—not required; LS—LMH; PR—LMH.</b> FIRE SUPPRESSION PIPING: Fire suppression piping is anchored and braced in accordance with NFPA-13.	13.7.4	A.7.13.1	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>HR—not required; LS—LMH; PR—LMH.</b> FLEXIBLE COUPLINGS: Fire suppression piping has flexible couplings in accordance with NFPA-13.	13.7.4	A.7.13.2	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>HR—not required; LS—LMH; PR—LMH.</b> EMERGENCY POWER: Equipment used to power or control Life Safety systems is anchored or braced.	13.7.7	A.7.12.1	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>HR—not required; LS—LMH; PR—LMH.</b> STAIR AND SMOKE DUCTS: Stair pressurization and smoke control ducts are braced and have flexible connections at seismic joints.	13.7.6	A.7.14.1	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>HR—not required; LS—MH; PR—MH.</b> SPRINKLER CEILING CLEARANCE: Penetrations through panelized ceilings for fire suppression devices provide clearances in accordance with NFPA-13.	13.7.4	A.7.13.3	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>HR—not required; LS—not required; PR—LMH.</b> EMERGENCY LIGHTING: Emergency and egress lighting equipment is anchored or braced.	13.7.9	A.7.3.1	
<b>Hazardous Materials</b>							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>HR—LMH; LS—LMH; PR—LMH.</b> HAZARDOUS MATERIAL EQUIPMENT: Equipment mounted on vibration isolators and containing hazardous material is equipped with restraints or snubbers.	13.7.1	A.7.12.2	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>HR—LMH; LS—LMH; PR—LMH.</b> HAZARDOUS MATERIAL STORAGE: Breakable containers that hold hazardous material, including gas cylinders, are restrained by latched doors, shelf lips, wires, or other methods.	13.8.3	A.7.15.1	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>HR—MH; LS—MH; PR—MH.</b> HAZARDOUS MATERIAL DISTRIBUTION: Piping or ductwork conveying hazardous materials is braced or otherwise protected from damage that would allow hazardous material release.	13.7.3 13.7.5	A.7.13.4	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>HR—MH; LS—MH; PR—MH.</b> SHUTOFF VALVES: Piping containing hazardous material, including natural gas, has shutoff valves or other devices to limit spills or leaks.	13.7.3 13.7.5	A.7.13.3	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>HR—LMH; LS—LMH; PR—LMH.</b> FLEXIBLE COUPLINGS: Hazardous material ductwork and piping, including natural gas piping, have flexible couplings.	13.7.3 13.7.5	A.7.15.4	

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<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—MH; LS—MH; PR—MH.</b> PIPING OR DUCTS	13.7.3	A.7.13.6
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	CROSSING SEISMIC JOINTS: Piping or ductwork carrying hazardous material that either crosses seismic joints or isolation planes or is connected to independent structures has couplings or other details to accommodate the relative seismic displacements.	13.7.5 13.7.6	
<b>Partitions</b>						
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—LMH; LS—LMH; PR—LMH.</b> UNREINFORCED MASONRY: Unreinforced masonry or hollow-clay tile partitions are braced at a spacing of at most 10 ft (3.0 m) in Low or Moderate Seismicity, or at most 6 ft (1.8 m) in High Seismicity.	13.6.2	A.7.1.1
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—LMH; LS—LMH; PR—LMH.</b> HEAVY PARTITIONS SUPPORTED BY CEILINGS: The tops of masonry or hollow-clay tile partitions are not laterally supported by an integrated ceiling system.	13.6.2	A.7.2.1
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—MH; PR—MH.</b> DRIFT: Rigid cementitious partitions are detailed to accommodate the following drift ratios: in steel moment frame, concrete moment frame, and wood frame buildings, 0.02; in other buildings, 0.005.	13.6.2	A.7.1.2
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—MH.</b> LIGHT PARTITIONS SUPPORTED BY CEILINGS: The tops of gypsum board partitions are not laterally supported by an integrated ceiling system.	13.6.2	A.7.2.1
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—MH.</b> STRUCTURAL SEPARATIONS: Partitions that cross structural separations have seismic or control joints.	13.6.2	A.7.1.3
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—MH.</b> TOPS: The tops of ceiling-high framed or panelized partitions have lateral bracing to the structure at a spacing equal to or less than 6 ft (1.8 m).	13.6.2	A.7.1.4
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
<b>Ceilings</b>						
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—H; LS—MH; PR—LMH.</b> SUSPENDED LATH AND PLASTER: Suspended lath and plaster ceilings have attachments that resist seismic forces for every 12 ft <sup>2</sup> (1.1 m <sup>2</sup> ) of area.	13.6.4	A.7.2.3
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—MH; PR—LMH.</b> SUSPENDED GYPSUM BOARD: Suspended gypsum board ceilings have attachments that resist seismic forces for every 12 ft <sup>2</sup> (1.1 m <sup>2</sup> ) of area.	13.6.4	A.7.2.3
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>			

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<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—MH.</b>	13.6.4	A.7.2.2
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	INTEGRATED CEILINGS: Integrated suspended ceilings with continuous areas greater than 144 ft <sup>2</sup> (13.4 m <sup>2</sup> ) and ceilings of smaller areas that are not surrounded by restraining partitions are laterally restrained at a spacing no greater than 12 ft (3.6 m) with members attached to the structure above. Each restraint location has a minimum of four diagonal wires and compression struts, or diagonal members capable of resisting compression.		
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—MH.</b>	13.6.4	A.7.2.4
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	EDGE CLEARANCE: The free edges of integrated suspended ceilings with continuous areas greater than 144 ft <sup>2</sup> (13.4 m <sup>2</sup> ) have clearances from the enclosing wall or partition of at least the following: in Moderate Seismicity, 1/2 in. (13 mm); in High Seismicity, 3/4 in. (19 mm).		
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—MH.</b>	13.6.4	A.7.2.5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	CONTINUITY ACROSS STRUCTURE JOINTS: The ceiling system does not cross any seismic joint and is not attached to multiple independent structures.		
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—H. EDGE</b>	13.6.4	A.7.2.6
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SUPPORT: The free edges of integrated suspended ceilings with continuous areas greater than 144 ft <sup>2</sup> (13.4 m <sup>2</sup> ) are supported by closure angles or channels not less than 2 in. (51 mm) wide.		
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—H.</b>	13.6.4	A.7.2.7
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SEISMIC JOINTS: Acoustical tile or lay-in panel ceilings have seismic separation joints such that each continuous portion of the ceiling is no more than 2,500 ft <sup>2</sup> (232.3 m <sup>2</sup> ) and has a ratio of long-to-short dimension no more than 4-to-1.		
<b>Light Fixtures</b>						
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—MH; PR—MH.</b>	13.6.4	A.7.3.2
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	INDEPENDENT SUPPORT: Light fixtures that weigh more per square foot than the ceiling they penetrate are supported independent of the grid ceiling suspension system by a minimum of two wires at diagonally opposite corners of each fixture.	13.7.9	

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<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—H.</b>	13.7.9	A.7.3.3
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>PENDANT SUPPORTS:</b> Light fixtures on pendant supports are attached at a spacing equal to or less than 6 ft. Unbraced suspended fixtures are free to allow a 360-degree range of motion at an angle not less than 45 degrees from horizontal without contacting adjacent components. Alternatively, if rigidly supported and/or braced, they are free to move with the structure to which they are attached without damaging adjoining components. Additionally, the connection to the structure is capable of accommodating the movement without failure.		
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—H. LENS COVERS:</b> Lens covers on light fixtures are attached with safety devices.	13.7.9	A.7.3.4
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
<b>Cladding and Glazing</b>						
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—MH; LS—MH; PR—MH. CLADDING ANCHORS:</b>	13.6.1	A.7.4.1
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Cladding components weighing more than 10 lb/ft <sup>2</sup> (0.48 kN/m <sup>2</sup> ) are mechanically anchored to the structure at a spacing equal to or less than the following: for Life Safety in Moderate Seismicity, 6 ft (1.8 m); for Life Safety in High Seismicity and for Position Retention in any seismicity, 4 ft (1.2 m)		
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—MH; PR—MH. CLADDING ISOLATION:</b> For steel or concrete moment-frame buildings, panel connections are detailed to accommodate a story drift ratio by the use of rods attached to framing with oversize holes or slotted holes of at least the following: for Life Safety in Moderate Seismicity, 0.01; for Life Safety in High Seismicity and for Position Retention in any seismicity, 0.02, and the rods have a length-to-diameter ratio of 4.0 or less.	13.6.1	A.7.4.3
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—MH; LS—MH; PR—MH. MULTI-STORY PANELS:</b>	13.6.1	A.7.4.4
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	For multi-story panels attached at more than one floor level, panel connections are detailed to accommodate a story drift ratio by the use of rods attached to framing with oversize holes or slotted holes of at least the following: for Life Safety in Moderate Seismicity, 0.01; for Life Safety in High Seismicity and for Position Retention in any seismicity, 0.02, and the rods have a length-to-diameter ratio of 4.0 or less.		

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—MH; PR—MH. THREADED</b>	13.6.1	A.7.4.9
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	RODS: Threaded rods for panel connections detailed to accommodate drift by bending of the rod have a length-to-diameter ratio greater than 0.06 times the story height in inches for Life Safety in Moderate Seismicity and 0.12 times the story height in inches for Life Safety in High Seismicity and Position Retention in any seismicity.		
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—MH; LS—MH; PR—MH. PANEL CONNECTIONS:</b>	13.6.1.4	A.7.4.5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Cladding panels are anchored out of plane with a minimum number of connections for each wall panel, as follows: for Life Safety in Moderate Seismicity, 2 connections; for Life Safety in High Seismicity and for Position Retention in any seismicity, 4 connections.		
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—MH; LS—MH; PR—MH. BEARING</b>	13.6.1.4	A.7.4.6
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	CONNECTIONS: Where bearing connections are used, there is a minimum of two bearing connections for each cladding panel.		
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—MH; LS—MH; PR—MH. INSERTS:</b> Where	13.6.1.4	A.7.4.7
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	concrete cladding components use inserts, the inserts have positive anchorage or are anchored to reinforcing steel.		
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—MH; PR—MH. OVERHEAD</b>	13.6.1.5	A.7.4.8
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	GLAZING: Glazing panes of any size in curtain walls and individual interior or exterior panes more than 16 ft <sup>2</sup> (1.5 m <sup>2</sup> ) in area are laminated annealed or laminated heat-strengthened glass and are detailed to remain in the frame when cracked.		
<b>Masonry Veneer</b>						
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—LMH; PR—LMH. TIES:</b>	13.6.1.2	A.7.5.1
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Masonry veneer is connected to the backup with corrosion-resistant ties. There is a minimum of one tie for every 2-2/3 ft <sup>2</sup> (0.25 m <sup>2</sup> ), and the ties have spacing no greater than the following: for Life Safety in Low or Moderate Seismicity, 36 in. (914 mm); for Life Safety in High Seismicity and for Position Retention in any seismicity, 24 in. (610 mm).		
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—LMH; PR—LMH. SHELF</b>	13.6.1.2	A.7.5.2
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ANGLES: Masonry veneer is supported by shelf angles or other elements at each floor above the ground floor.		
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—LMH; PR—LMH. WEAKENED</b>	13.6.1.2	A.7.5.3
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	PLANES: Masonry veneer is anchored to the backup adjacent to weakened planes, such as at the locations of flashing.		

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<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—LMH; LS—LMH; PR—LMH. UNREINFORCED</b>	13.6.1.1	A.7.7.2
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	MASONRY BACKUP: There is no unreinforced masonry backup.	13.6.1.2	
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—MH; PR—MH. STUD</b>	13.6.1.1	A.7.6.1
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TRACKS: For veneer with cold-formed steel stud backup, stud tracks are fastened to the structure at a spacing equal to or less than 24 in. (610 mm) on center.	13.6.1.2	
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—MH; PR—MH. ANCHORAGE:</b>	13.6.1.1	A.7.7.1
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	For veneer with concrete block or masonry backup, the backup is positively anchored to the structure at a horizontal spacing equal to or less than 4 ft along the floors and roof.	13.6.1.2	
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—MH.</b>	13.6.1.2	A.7.5.6
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	WEEP HOLES: In veneer anchored to stud walls, the veneer has functioning weep holes and base flashing.		
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—MH.</b>	13.6.1.1	A.7.6.2
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	OPENINGS: For veneer with cold-formed-steel stud backup, steel studs frame window and door openings.	13.6.1.2	
<b>Parapets, Cornices, Ornamentation, and Appendages</b>						
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—LMH; LS—LMH; PR—LMH. URM PARAPETS OR</b>	13.6.5	A.7.8.1
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	CORNICES: Laterally unsupported unreinforced masonry parapets or cornices have height-to-thickness ratios no greater than the following: for Life Safety in Low or Moderate Seismicity, 2.5; for Life Safety in High Seismicity and for Position Retention in any seismicity, 1.5.		
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—LMH; PR—LMH. CANOPIES:</b>	13.6.6	A.7.8.2
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Canopies at building exits are anchored to the structure at a spacing no greater than the following: for Life Safety in Low or Moderate Seismicity, 10 ft (3.0 m); for Life Safety in High Seismicity and for Position Retention in any seismicity, 6 ft (1.8 m).		
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—H; LS—MH; PR—LMH. CONCRETE PARAPETS:</b>	13.6.5	A.7.8.3
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Concrete parapets with height-to-thickness ratios greater than 2.5 have vertical reinforcement.		
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—MH; LS—MH; PR—LMH. APPENDAGES:</b>	13.6.6	A.7.8.4
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Cornices, parapets, signs, and other ornamentation or appendages that extend above the highest point of anchorage to the structure or cantilever from components are reinforced and anchored to the structural system at a spacing equal to or less than 6 ft (1.8 m). This evaluation statement item does not apply to parapets or cornices covered by other evaluation statements.		

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

<b>Masonry Chimneys</b>						
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>			
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<b>HR—LMH; LS—LMH; PR—LMH. URM CHIMNEYS:</b>	13.6.7	A.7.9.1
				Unreinforced masonry chimneys extend above the roof surface no more than the following: for Life Safety in Low or Moderate Seismicity, 3 times the least dimension of the chimney; for Life Safety in High Seismicity and for Position Retention in any seismicity, 2 times the least dimension of the chimney.		
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<b>HR—LMH; LS—LMH; PR—LMH. ANCHORAGE:</b>	13.6.7	A.7.9.2
				Masonry chimneys are anchored at each floor level, at the topmost ceiling level, and at the roof.		
<b>Stairs</b>						
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>			
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<b>HR—not required; LS—LMH; PR—LMH. STAIR ENCLOSURES:</b>	13.6.2 13.6.8	A.7.10.1
				Hollow-clay tile or unreinforced masonry walls around stair enclosures are restrained out of plane and have height-to-thickness ratios not greater than the following: for Life Safety in Low or Moderate Seismicity, 15-to-1; for Life Safety in High Seismicity and for Position Retention in any seismicity, 12-to-1.		
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<b>HR—not required; LS—LMH; PR—LMH. STAIR DETAILS:</b>	13.6.8	A.7.10.2
				The connection between the stairs and the structure does not rely on post-installed anchors in concrete or masonry, and the stair details are capable of accommodating the drift calculated using the Quick Check procedure of Section 4.4.3.1 for moment-frame structures or 0.5 in. for all other structures without including any lateral stiffness contribution from the stairs.		
<b>Contents and Furnishings</b>						
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>			
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<b>HR—LMH; LS—MH; PR—MH. INDUSTRIAL STORAGE RACKS:</b>	13.8.1	A.7.11.1
				Industrial storage racks or pallet racks more than 12 ft high meet the requirements of ANSI/RMI MH 16.1 as modified by ASCE 7, Chapter 15.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>HR—not required; LS—H; PR—MH. TALL NARROW CONTENTS:</b>	13.8.2	A.7.11.2
				Contents more than 6 ft (1.8 m) high with a height-to-depth or height-to-width ratio greater than 3-to-1 are anchored to the structure or to each other.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>HR—not required; LS—H; PR—H. FALL-PRONE CONTENTS:</b>	13.8.2	A.7.11.3
				Equipment, stored items, or other contents weighing more than 20 lb (9.1 kg) whose center of mass is more than 4 ft (1.2 m) above the adjacent floor level are braced or otherwise restrained.		

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<b>HR—not required; LS—not required; PR—MH.</b> ACCESS FLOORS: Access floors more than 9 in. (229 mm) high are braced.	13.6.10	A.7.11.4
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<b>HR—not required; LS—not required; PR—MH.</b> EQUIPMENT ON ACCESS FLOORS: Equipment and other contents supported by access floor systems are anchored or braced to the structure independent of the access floor.	13.7.7 13.6.10	A.7.11.5
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<b>HR—not required; LS—not required; PR—H.</b> SUSPENDED CONTENTS: Items suspended without lateral bracing are free to swing from or move with the structure from which they are suspended without damaging themselves or adjoining components.	13.8.2	A.7.11.6
<b>Mechanical and Electrical Equipment</b>						
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>HR—not required; LS—H; PR—H.</b> FALL-PRONE EQUIPMENT: Equipment weighing more than 20 lb (9.1 kg) whose center of mass is more than 4 ft (1.2 m) above the adjacent floor level, and which is not in-line equipment, is braced.	13.7.1 13.7.7	A.7.12.4
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>HR—not required; LS—H; PR—H.</b> IN-LINE EQUIPMENT: Equipment installed in line with a duct or piping system, with an operating weight more than 75 lb (34.0 kg), is supported and laterally braced independent of the duct or piping system.	13.7.1	A.7.12.5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>HR—not required; LS—H; PR—MH.</b> TALL NARROW EQUIPMENT: Equipment more than 6 ft (1.8 m) high with a height-to-depth or height-to-width ratio greater than 3-to-1 is anchored to the floor slab or adjacent structural walls.	13.7.1 13.7.7	A.7.12.6
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>HR—not required; LS—not required; PR—MH.</b> MECHANICAL DOORS: Mechanically operated doors are detailed to operate at a story drift ratio of 0.01.	13.6.9	A.7.12.7
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>HR—not required; LS—not required; PR—H.</b> SUSPENDED EQUIPMENT: Equipment suspended without lateral bracing is free to swing from or move with the structure from which it is suspended without damaging itself or adjoining components.	13.7.1 13.7.7	A.7.12.8
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>HR—not required; LS—not required; PR—H.</b> VIBRATION ISOLATORS: Equipment mounted on vibration isolators is equipped with horizontal restraints or snubbers and with vertical restraints to resist overturning.	13.7.1	A.7.12.9
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>HR—not required; LS—not required; PR—H.</b> HEAVY EQUIPMENT: Floor-supported or platform-supported equipment weighing more than 400 lb (181.4 kg) is anchored to the structure.	13.7.1 13.7.7	A.7.12.10

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>HR—not required; LS—not required; PR—H.</b> ELECTRICAL EQUIPMENT: Electrical equipment is laterally braced to the structure.	13.7.7	A.7.12.11
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>HR—not required; LS—not required; PR—H.</b> CONDUIT COUPLINGS: Conduit greater than 2.5 in. (64 mm) trade size that is attached to panels, cabinets, or other equipment and is subject to relative seismic displacement has flexible couplings or connections.	13.7.8	A.7.12.12
<b>Piping</b>						
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>HR—not required; LS—not required; PR—H.</b> FLEXIBLE COUPLINGS: Fluid and gas piping has flexible couplings.	13.7.3 13.7.5	A.7.13.2
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>HR—not required; LS—not required; PR—H.</b> FLUID AND GAS PIPING: Fluid and gas piping is anchored and braced to the structure to limit spills or leaks.	13.7.3 13.7.5	A.7.13.4
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>HR—not required; LS—not required; PR—H.</b> C-CLAMPS: One-sided C-clamps that support piping larger than 2.5 in. (64 mm) in diameter are restrained.	13.7.3 13.7.5	A.7.13.5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>HR—not required; LS—not required; PR—H.</b> PIPING CROSSING SEISMIC JOINTS: Piping that crosses seismic joints or isolation planes or is connected to independent structures has couplings or other details to accommodate the relative seismic displacements.	13.7.3 13.7.5	A.7.13.6
<b>Ducts</b>						
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>HR—not required; LS—not required; PR—H.</b> DUCT BRACING: Rectangular ductwork larger than 6 ft <sup>2</sup> (0.56 m <sup>2</sup> ) in cross-sectional area and round ducts larger than 28 in. (711 mm) in diameter are braced. The maximum spacing of transverse bracing does not exceed 30 ft (9.2 m). The maximum spacing of longitudinal bracing does not exceed 60 ft (18.3 m).	13.7.6	A.7.14.2
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>HR—not required; LS—not required; PR—H.</b> DUCT SUPPORT: Ducts are not supported by piping or electrical conduit.	13.7.6	A.7.14.3
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>HR—not required; LS—not required; PR—H.</b> DUCTS CROSSING SEISMIC JOINTS: Ducts that cross seismic joints or isolation planes or are connected to independent structures have couplings or other details to accommodate the relative seismic displacements.	13.7.6	A.7.14.4
<b>Elevators</b>						
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<b>HR—not required; LS—H; PR—H.</b> RETAINER GUARDS: Sheaves and drums have cable retainer guards.	13.7.11	A.7.16.1
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<b>HR—not required; LS—H; PR—H.</b> RETAINER PLATE: A retainer plate is present at the top and bottom of both car and counterweight.	13.7.11	A.7.16.2

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—H.</b>	13.7.11	A.7.16.3
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ELEVATOR EQUIPMENT: Equipment, piping, and other components that are part of the elevator system are anchored.		
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—H.</b>	13.7.11	A.7.16.4
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SEISMIC SWITCH: Elevators capable of operating at speeds of 150 ft/min (0.30 m/min) or faster are equipped with seismic switches that meet the requirements of ASME A17.1 or have trigger levels set to 20% of the acceleration of gravity at the base of the structure and 50% of the acceleration of gravity in other locations.		
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—H.</b>	13.7.11	A.7.16.5
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SHAFT WALLS: Elevator shaft walls are anchored and reinforced to prevent toppling into the shaft during strong shaking.		
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—H.</b>	13.7.11	A.7.16.6
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	COUNTERWEIGHT RAILS: All counterweight rails and divider beams are sized in accordance with ASME A17.1.		
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—H.</b>	13.7.11	A.7.16.7
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	BRACKETS: The brackets that tie the car rails and the counterweight rail to the structure are sized in accordance with ASME A17.1.		
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—H.</b>	13.7.11	A.7.16.8
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SPREADER BRACKET: Spreader brackets are not used to resist seismic forces.		
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—H. GO-</b>	13.7.11	A.7.16.9
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SLOW ELEVATORS: The building has a go-slow elevator system.		

<sup>a</sup> Performance Level: HR = Hazards Reduced, LS = Life Safety, and PR = Position Retention.

<sup>b</sup> Level of Seismicity: L = Low, M = Moderate, and H = High.

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

**APPENDIX B: Swim Center Tier 1 Seismic Evaluation Photos**



*Looking west from Bozeman High School*



*Cracks in EIFS*



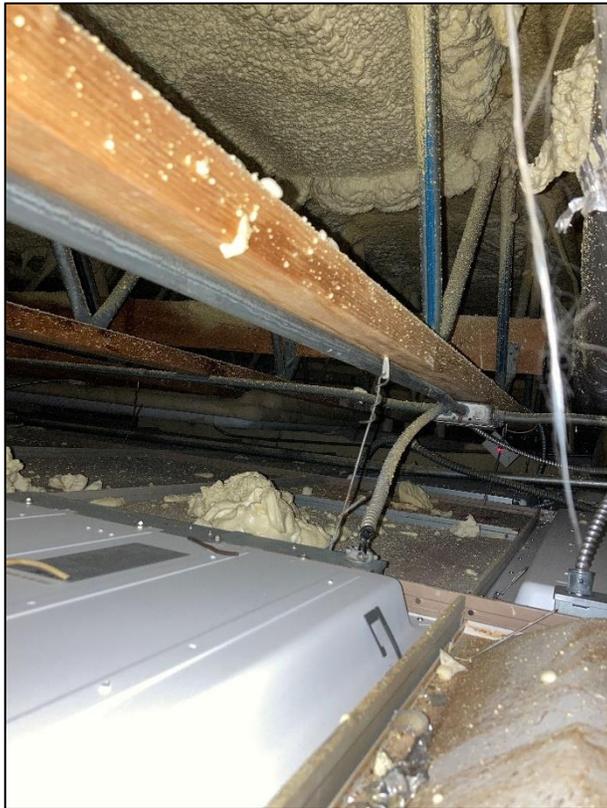
*Natorium foundation*



*Hybrid steel/wood open web roof joists in locker rooms – top chord obstructed from view by spray insulation*



*Hybrid steel/wood open web roof joists in locker rooms – top chord obstructed from view by spray insulation*



*Nonstructural components attachment to roof trusses in locker rooms*



*Ceiling attachment to roof trusses in locker rooms*



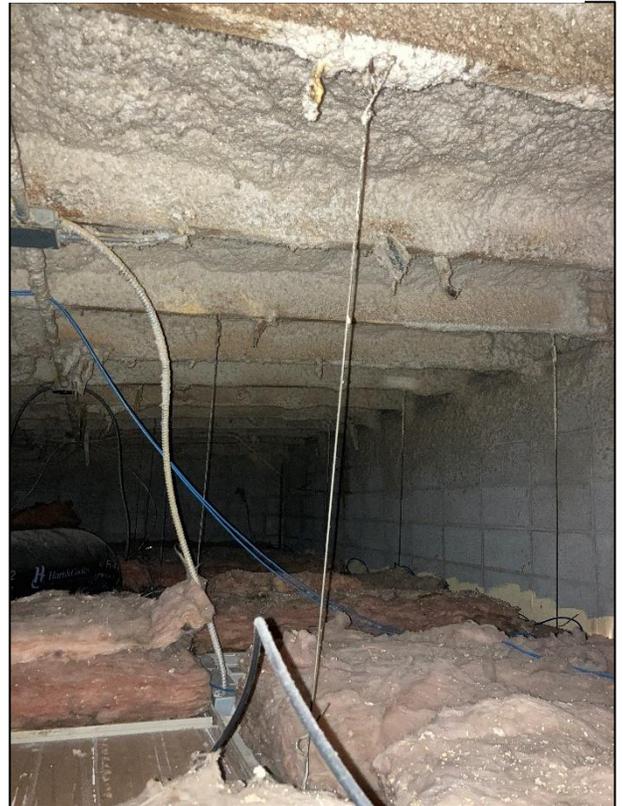
*Ledger connection at bearing wall in locker rooms*



*Nonstructural components attachment to roof trusses in locker rooms*



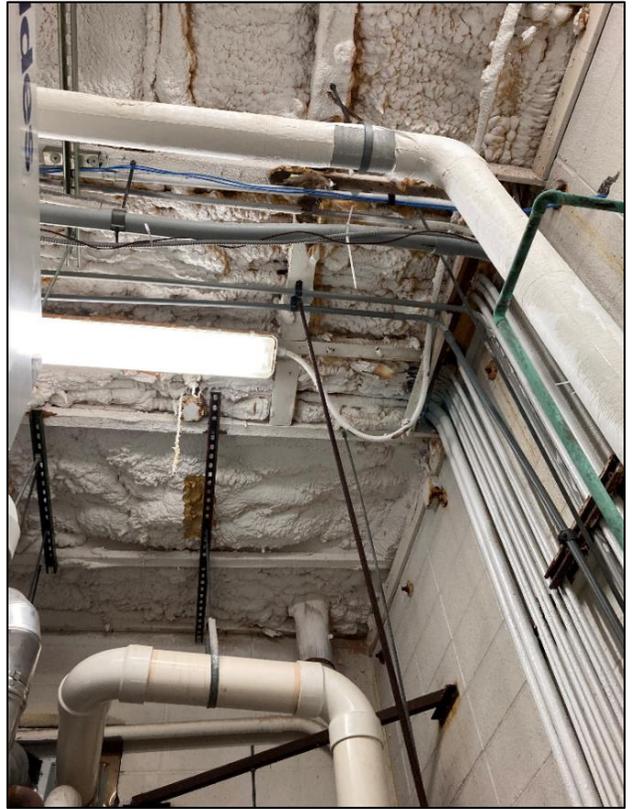
*Interior CMU wall lacking discernible out-of-plane top of wall bracing*



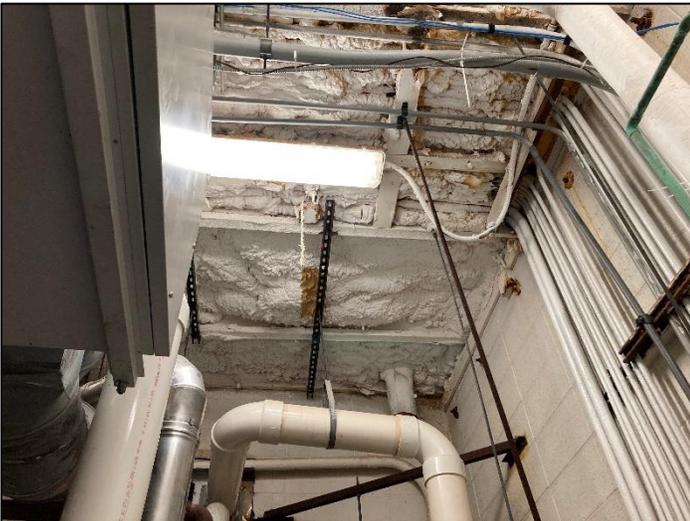
*Roof framing above the Manager's office*



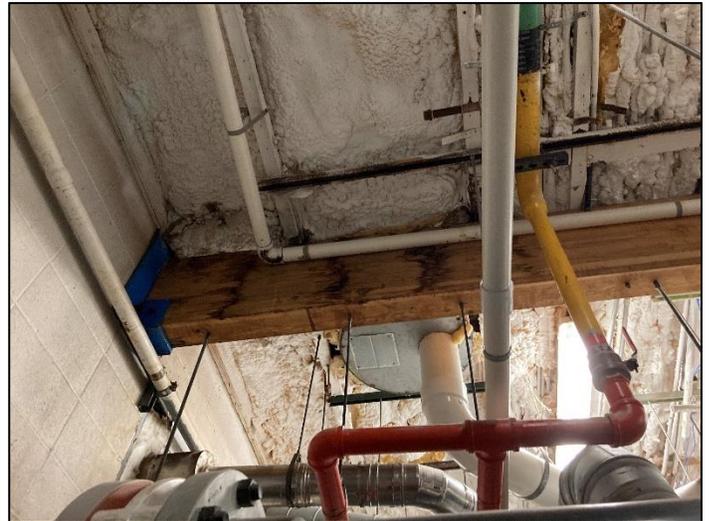
*Water ponding above the filter room*



*Typical roof framing and insulation— connections obstructed from view by spray insulate and nonstructural systems*



*Typical roof framing and insulation— connections obstructed from view by spray insulate and nonstructural systems*



*Glulam roof beam with water staining (filter room)*



*Lack of a positive connection to transfer lateral load from the roof diaphragm to the walls at the filter room*



*Nonstructural components attachment to roof trusses in locker rooms*



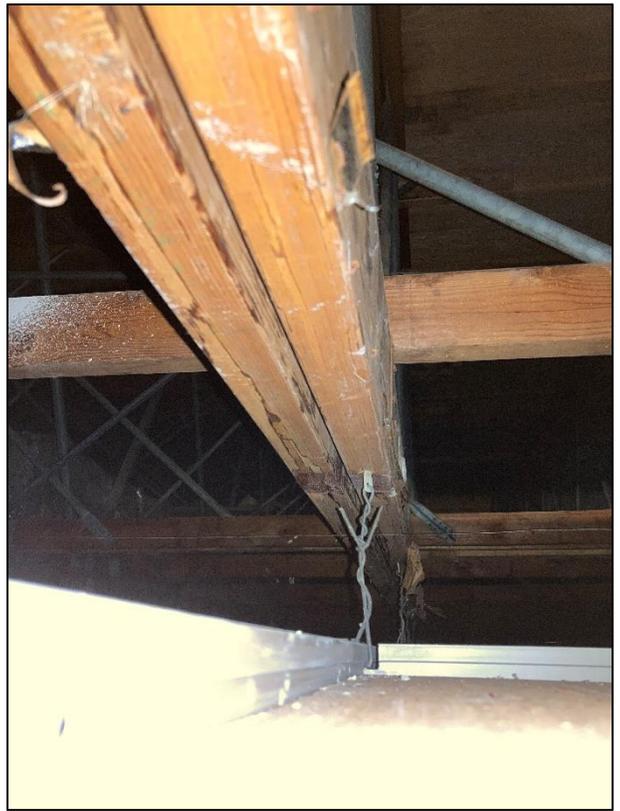
*Typical blocking/roof truss/connection configuration at the natatorium roof*



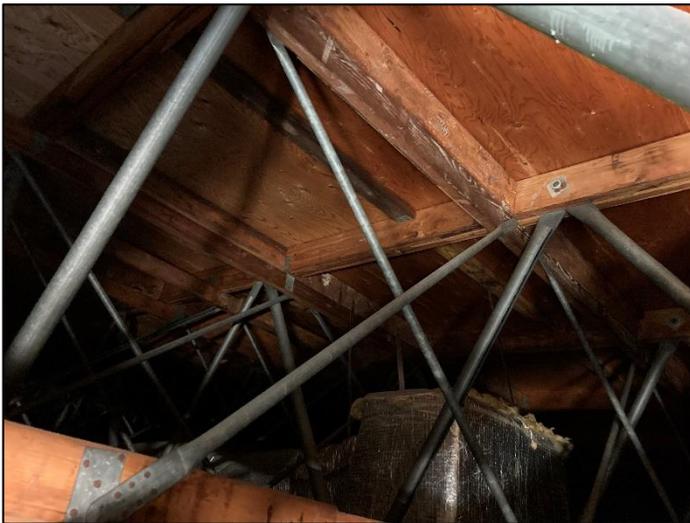
*Ceiling attachment to roof trusses in natatorium*



*Typical rusted nails at blocking-to-truss connections at the natatorium roof trusses*



*Natatorium roof truss bottom chord with mild checking*



*Natatorium roof decking is straight-sheathed and blocked*



*Natatorium roof decking is straight-sheathed and blocked*



*Natatorium roof framing connection west CMU bearing wall, connections obstructed by spray foam insulation, connections not built in accordance with 1974 Construction Documents*



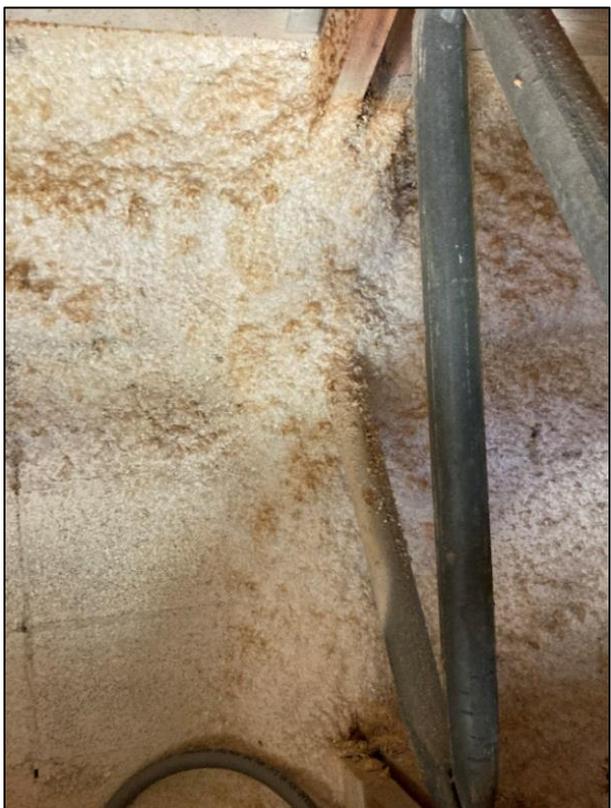
*Nonstructural components attachment to roof trusses in locker rooms*



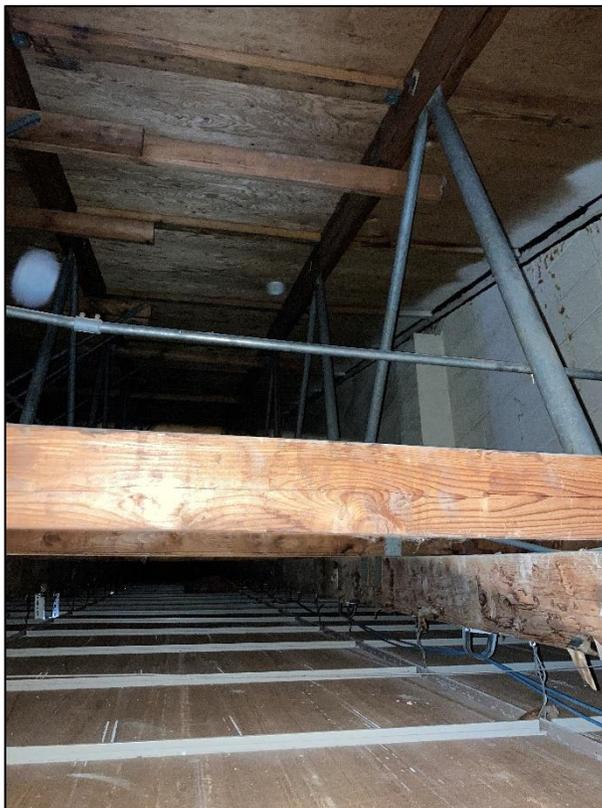
*Natatorium roof framing connection west CMU bearing wall, connections obstructed by spray foam insulation*



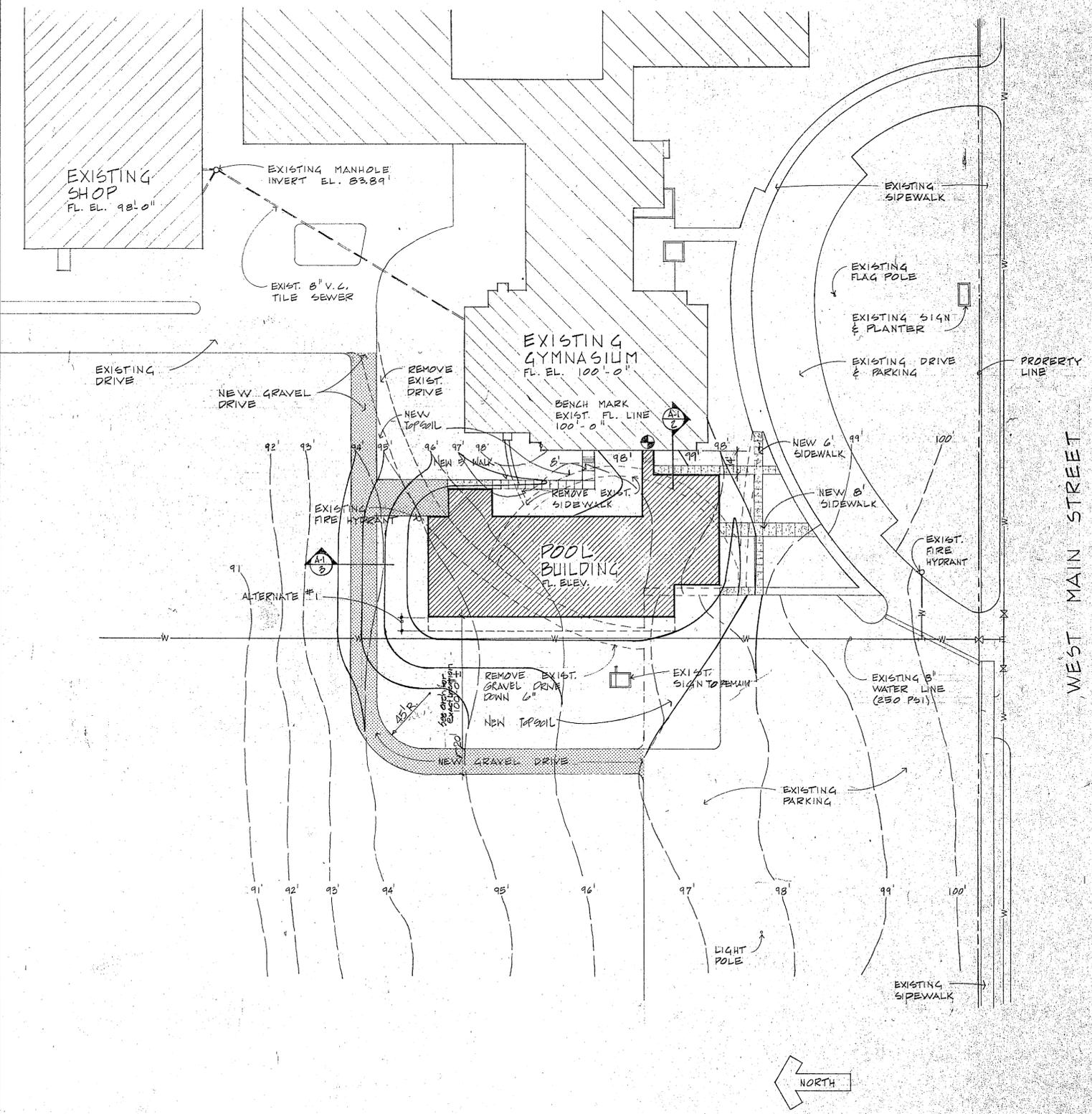
*Nonstructural components attachment to roof trusses in natatorium*



*Natatorium roof framing connection west CMU bearing wall, connections obstructed by spray foam insulation, connections not built in accordance with 1974 Construction Documents*

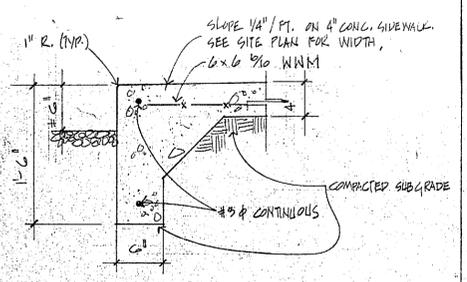


*Natatorium roof framing connection to south CMU end wall, connections were not built in accordance with 1974 Construction Documents*

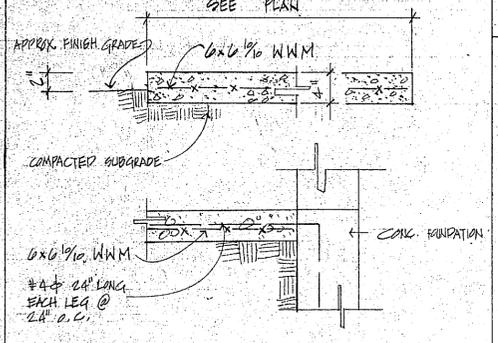


SITE PLAN

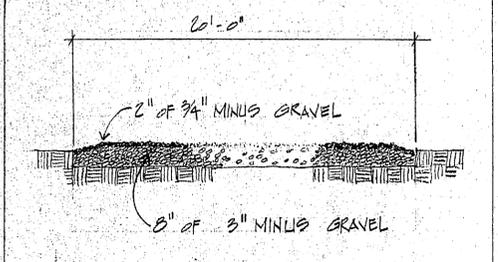
1" = 50'-0"



1 CURB DETAIL 1" = 1'-0"



2 SIDEWALK DETAIL 1" = 1'-0"



3 ROAD CROSS SECTION

	EARTH		GYPSUM BOARD
	GRAVEL		INSULATION
	CONCRETE		ACOUSTICAL TILE
	CONCRETE BLOCK		METAL
	EXISTING MASONRY		GROUT
	DIMENSION LUMBER		
	FINISHED WOOD		
	PLYWOOD		

MATERIAL LEGEND

ARCHITECTURAL DRAWINGS

- A-1 SITE PLAN - LEGEND
- A-2 FLOOR PLAN - BASE BID
- A-3 FLOOR PLAN - ALTERNATE No.1
- A-4 DOOR, HARDWARE, ROOM FINISH SCHEDULES
- A-5 EXTERIOR ELEVATIONS
- A-6 EXTERIOR ELEVATIONS - DETAILS
- A-7 BUILDING SECTIONS
- A-8 WALL SECTIONS - DETAILS
- A-9 WALL SECTIONS - DETAILS
- A-10 MILLWORK - DETAILS - SECTIONS
- A-11 INTERIOR ELEVATIONS
- A-12 REFLECTED CEILING PLAN

STRUCTURAL DRAWINGS

- S-1 FOUNDATION PLAN - BASE BID
- S-2 ROOF PLAN - BASE BID
- S-3 SECTIONS
- S-4 SECTIONS, DETAILS, NOTES
- S-5 FOUNDATION - ROOF FRAMING PLAN - ALTERNATE #1

MECHANICAL DRAWINGS

- ME-1 MECHANICAL - ELECTRICAL SITE PLAN
- M-1 PLUMBING PLAN - BASE BID
- M-2 PLUMBING PLAN - ALTERNATE #1
- M-3 HEATING - VENTILATING BASE BID - DETAILS
- M-4 HEATING - VENTILATING ALTERNATE #1

ELECTRICAL DRAWINGS ALSO SEE ME-1

- E-1 LIGHTING PLAN - BASE BID
- E-2 POWER PLAN - BASE BID
- E-3 LIGHTING - POWER PLAN - ALTERNATE #1

SWIMMING POOL PLANS

- SP-1 SWIMMING POOL PLAN
- SP-2 SWIMMING POOL DETAILS
- SP-3 SWIMMING POOL PIPING PLAN
- SP-4 SWIMMING POOL EQUIPMENT
- SP-5 SWIMMING POOL DETAILS - SECTIONS



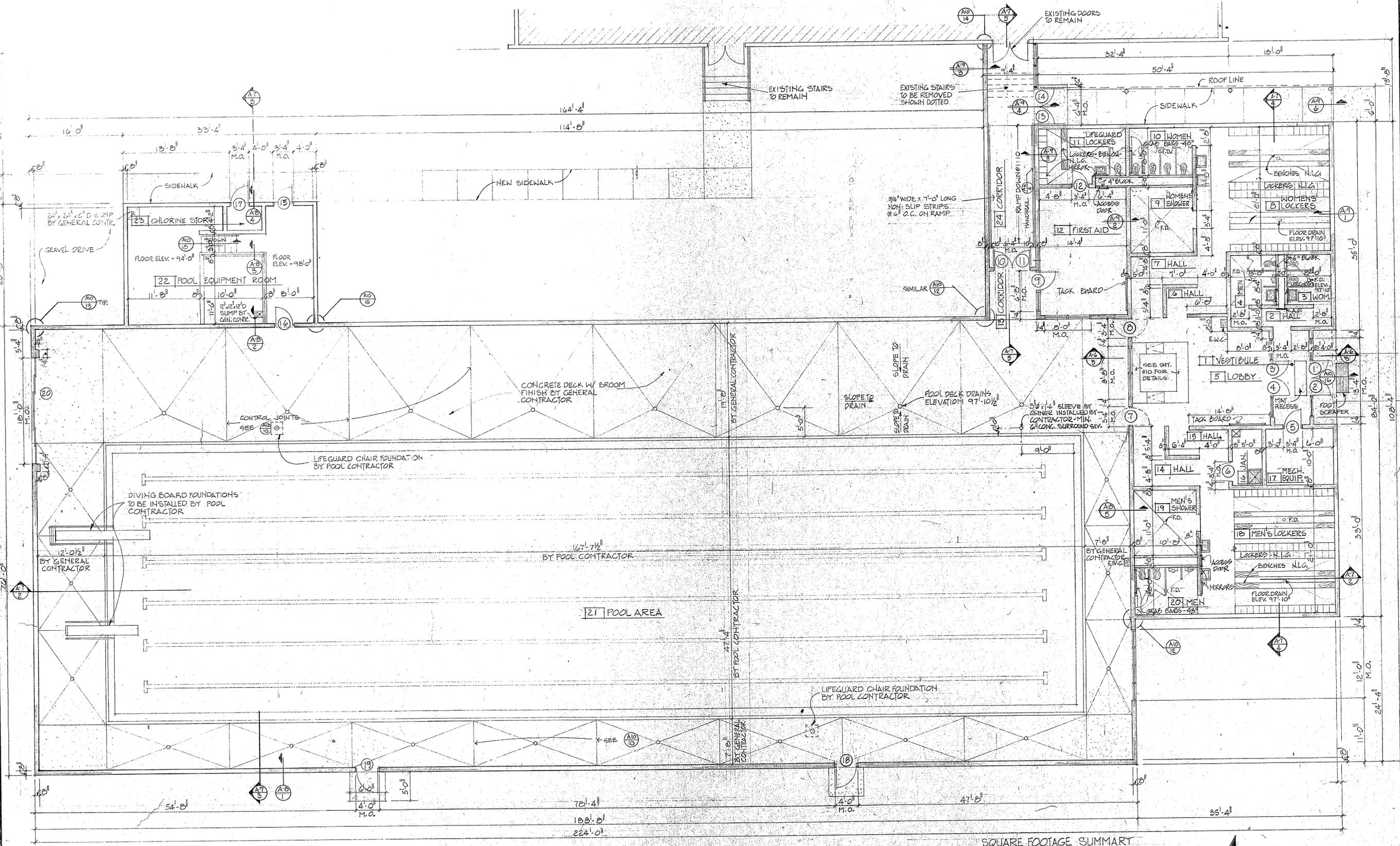
ENGINEER  
 O. Berg, Jr., No. 200  
 W.E. Grabow - 300  
 W.A. Schofield - 199  
 STATE OF MONTANA  
 LICENSED PROFESSIONAL ARCHITECTS

OWNER CITY OF BOZEMAN, MONTANA  
 PROJECT BOZEMAN MUNICIPAL POOL  
 SHEET SITE PLAN - LEGEND

**BERG-GRABOW & PARTNERS**  
 ARCHITECTS-ENGINEERS-PLANNING CONSULTANTS  
 bozeman montana

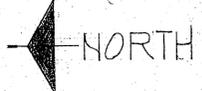
JOB NO. 7407  
 DEC. 1974  
**A-1**  
 OF 12

EXISTING SENIOR HIGH SCHOOL



SQUARE FOOTAGE SUMMARY

SWIMMING POOL	14,884 S.F.
POOL EQUIPMENT	686 S.F.
LOCKER ROOMS	3,833 S.F.
TOTAL	19,403 S.F.



NOTE - SEE SHEET A-11 FOR INTERIOR ELEVATIONS

① FLOOR PLAN - BASE BID

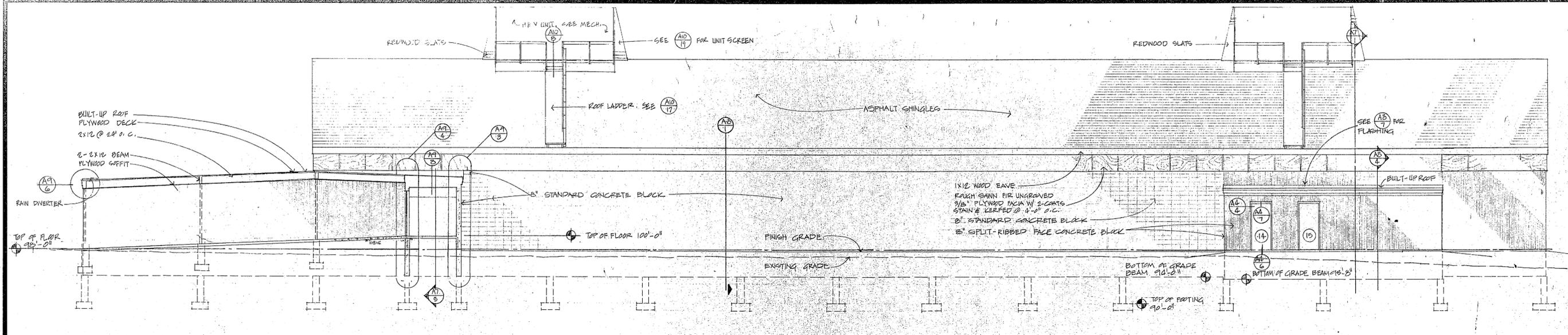
ENGINEER  
 SHEET NUMBER  
 DETAIL NUMBER  
 DRAWN BY  
 CHECKED BY

OWNER CITY OF BOZEMAN, MONTANA  
 PROJECT BOZEMAN MUNICIPAL POOL  
 SHEET FLOOR PLAN - BASE BID

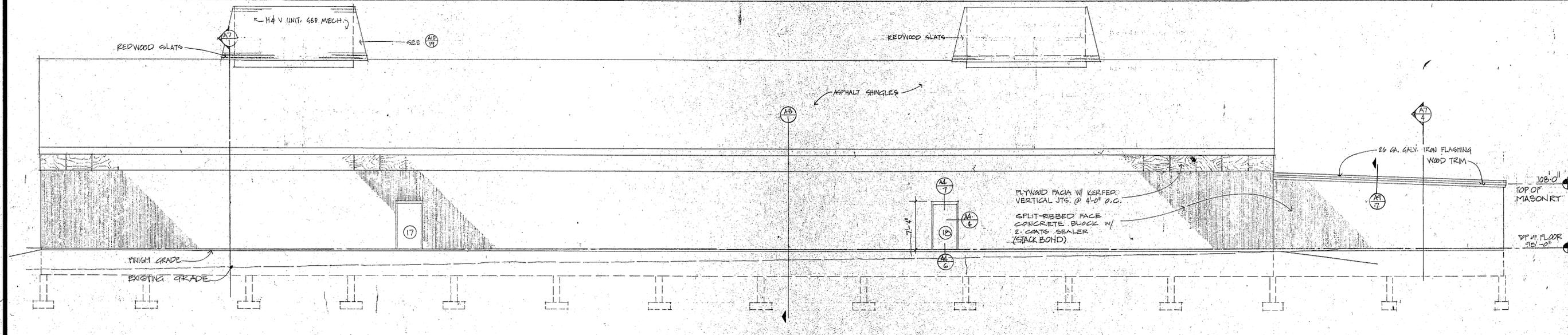
**BERG - GRABOW & PARTNERS**  
 ARCHITECTS-ENGINEERS-PLANNING CONSULTANTS  
 bozeman montana



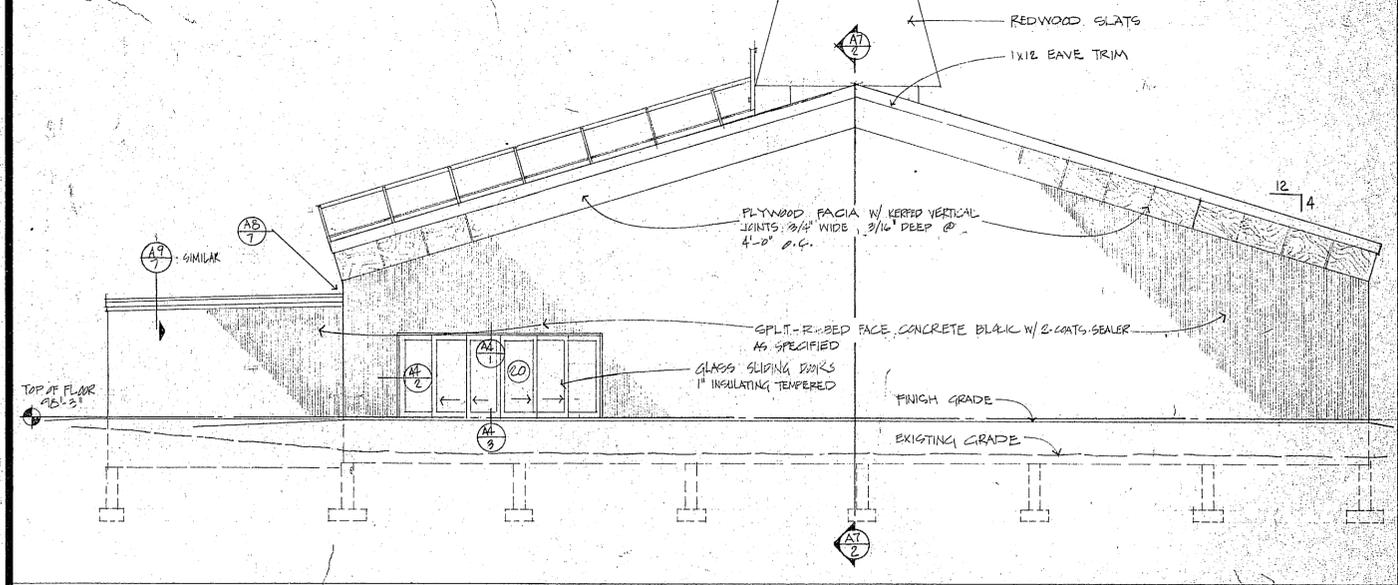




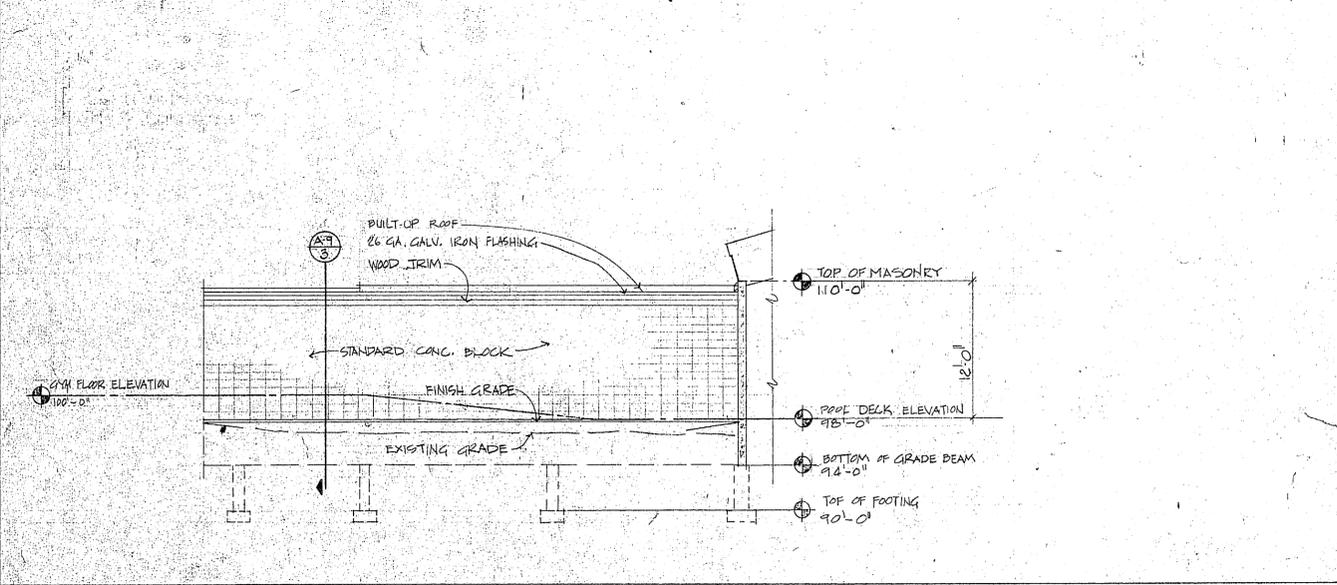
① EAST ELEVATION - ALTERNATE #1 & BASE BID 1/8" = 1'-0"



② WEST ELEVATION - ALTERNATE #1 & BASE BID 1/8" = 1'-0"



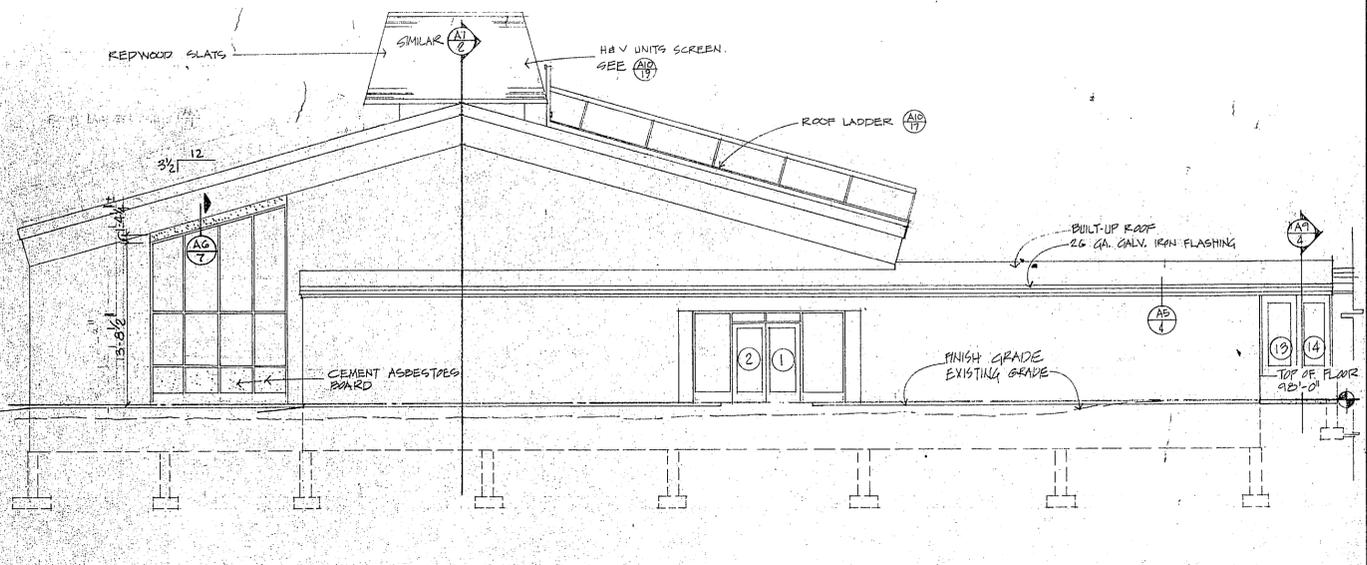
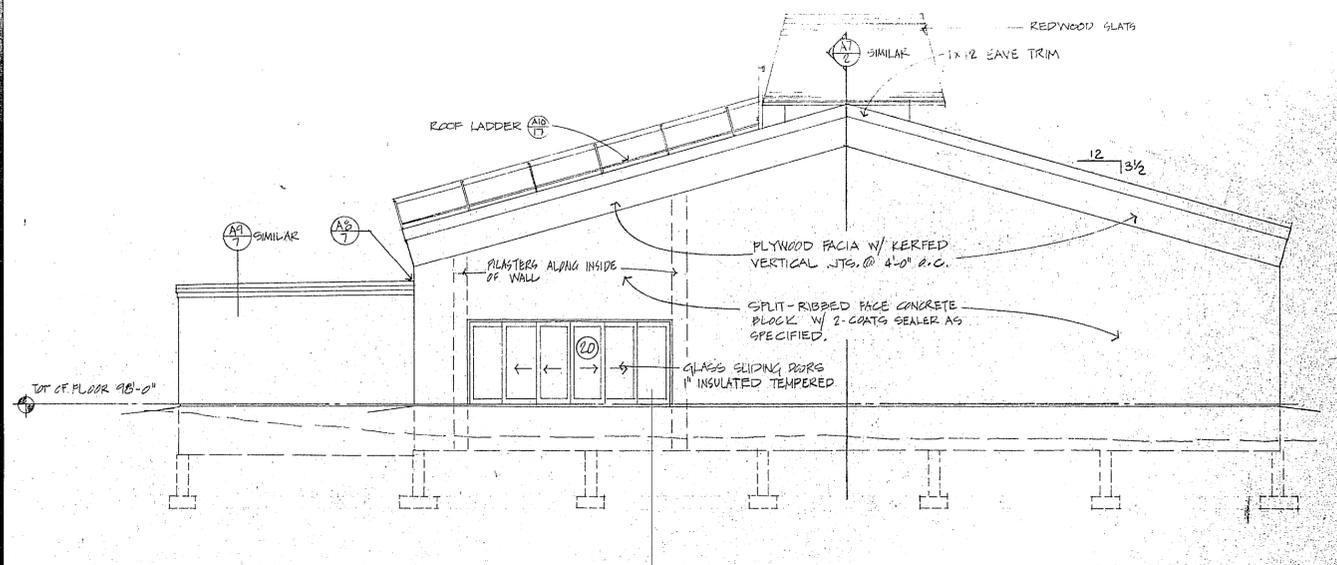
③ NORTH ELEVATION - ALTERNATE #1 1/8" = 1'-0"



④ NORTH ELEVATION OF CORRIDOR #24 1/8" = 1'-0"

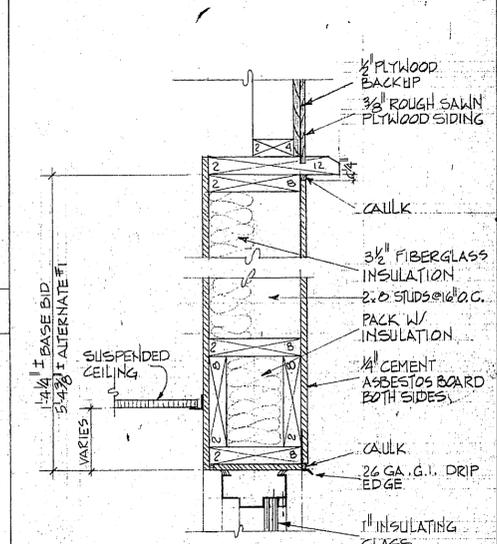
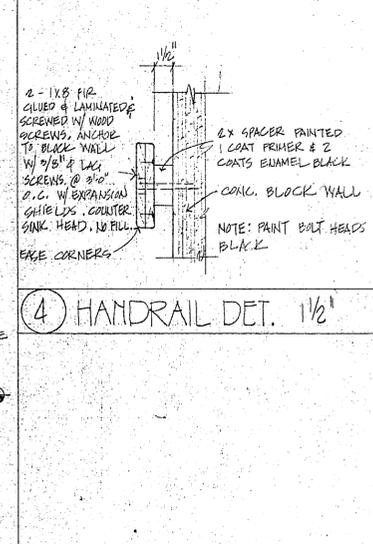
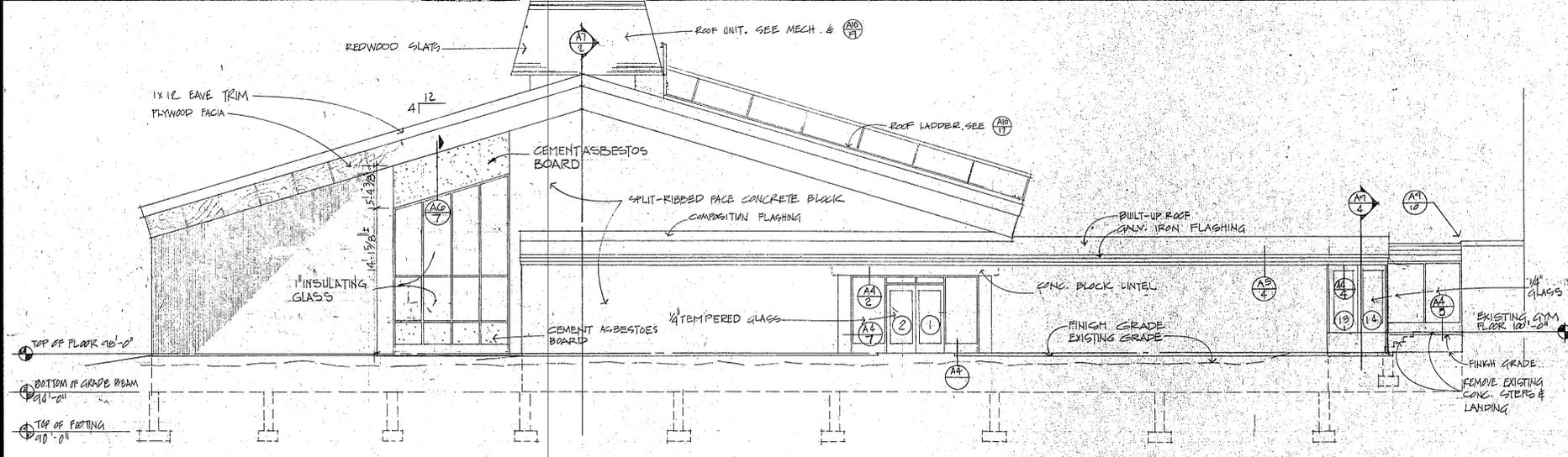
ENGINEER  
 CITY OF BOZEMAN, MONTANA  
 PROJECT BOZEMAN MUNICIPAL POOL  
 SHEET EXTERIOR ELEVATIONS  
 DRAWINGS MAY BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT PERMISSION IN WRITING FROM THE ARCHITECTS & ENGINEERS BOARD OF MONTANA.  
 SCALE: DRAWING NUMBER: 1/8" = 1'-0"  
 SHEET NUMBER: 1  
 DETAIL KEY

**BERG-GRABOW & PARTNERS**  
 ARCHITECTS-ENGINEERS-PLANNING CONSULTANTS  
 bozeman montana



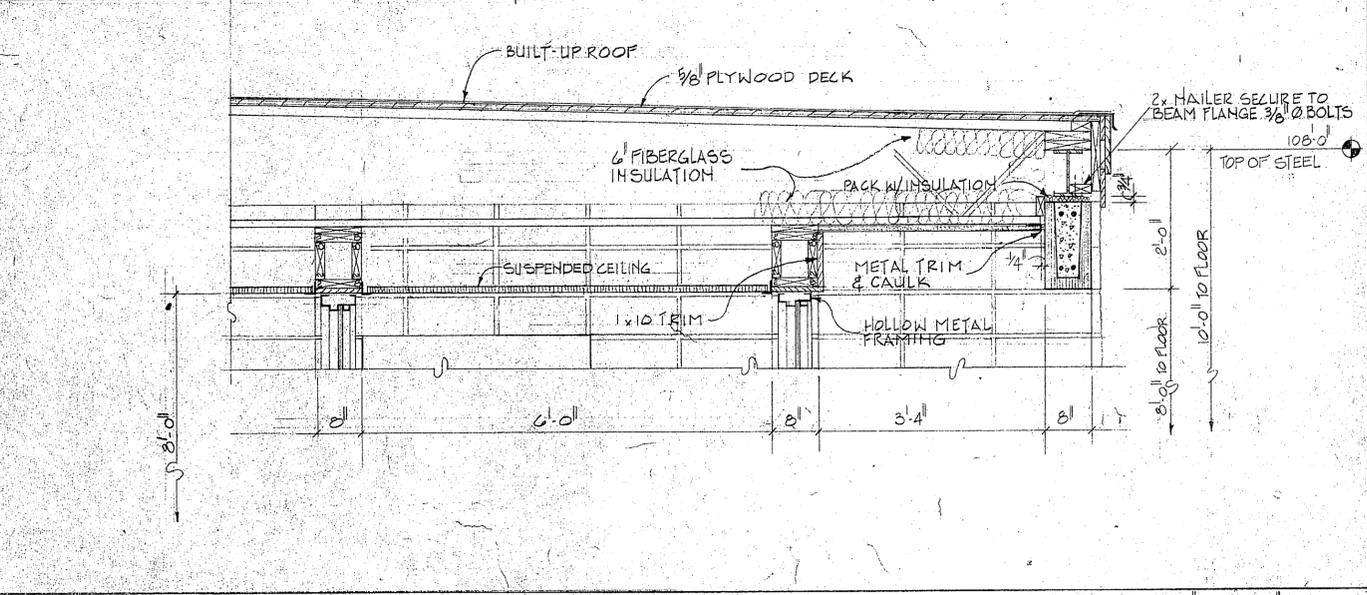
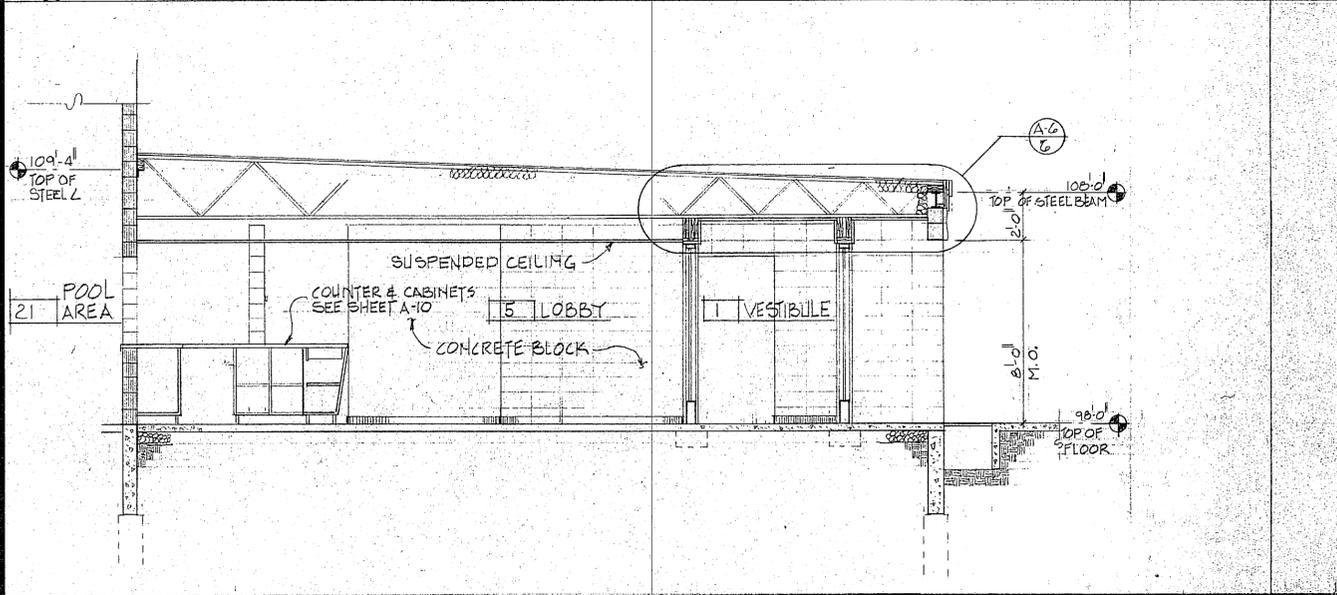
① NORTH ELEVATION - BASE BID  $1/8" = 1'-0"$

② SOUTH ELEVATION - BASE BID  $1/8" = 1'-0"$



③ SOUTH ELEVATION - ALTERNATE 1  $1/8" = 1'-0"$

⑦ WALL DETAIL  $1/2" = 1'-0"$



⑤ PARTIAL BUILDING SECTION @ MAIN ENTRANCE  $1/4" = 1'-0"$

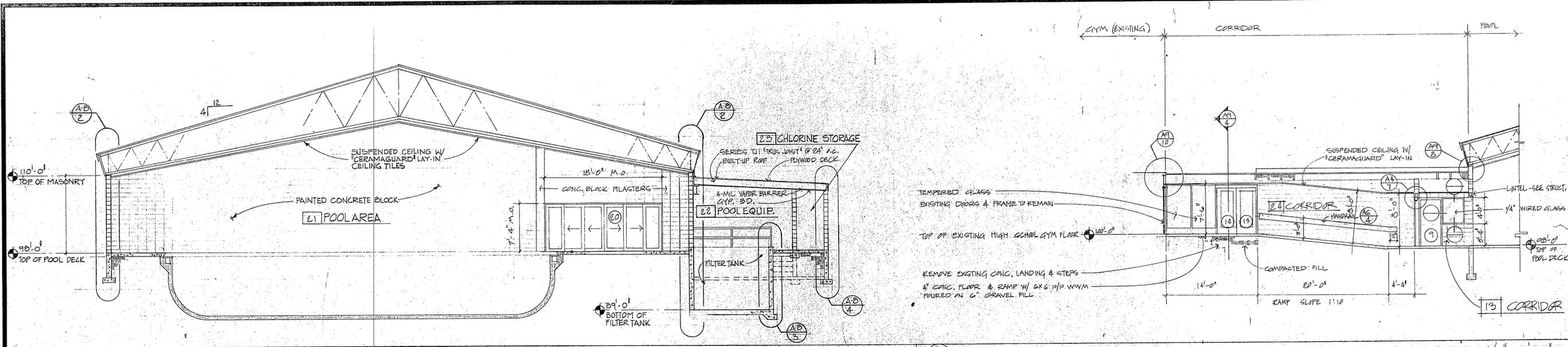
⑥ SECTION @ MAIN ENTRANCE DOOR HEADS  $3/4" = 1'-0"$

ENGINEER  
 SHEET NUMBER  
 DRAWING NUMBER  
 DETAIL KEY

OWNER  
 CITY OF BOZEMAN, MONTANA  
 PROJECT  
 BOZEMAN MUNICIPAL POOL  
 SHEET  
 EXTERIOR ELEVATIONS - DETAILS

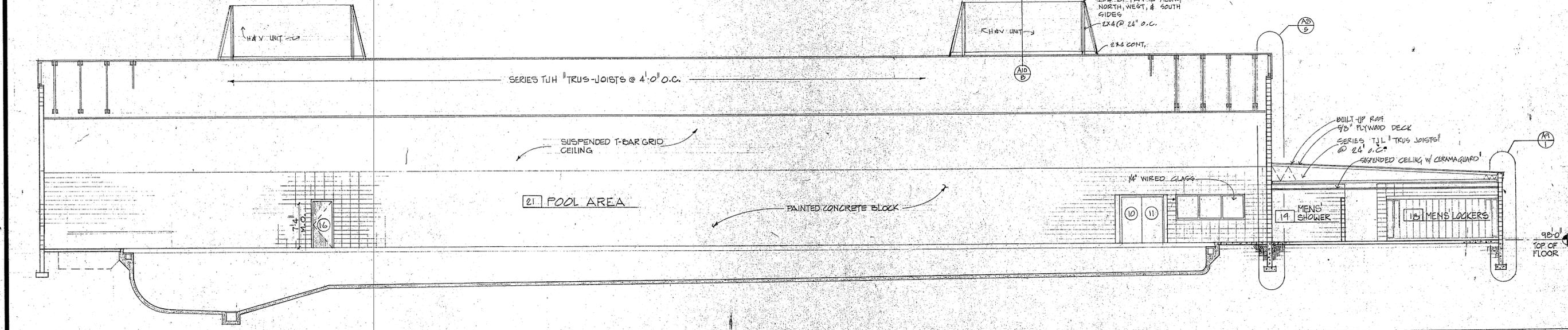
BERG-GRAW & PARTNERS  
 ARCHITECTS-ENGINEERS-PLANNING CONSULTANTS  
 bozeman montana

JOB NO. 7407  
 DEC. 1974  
 A-6  
 OF 12

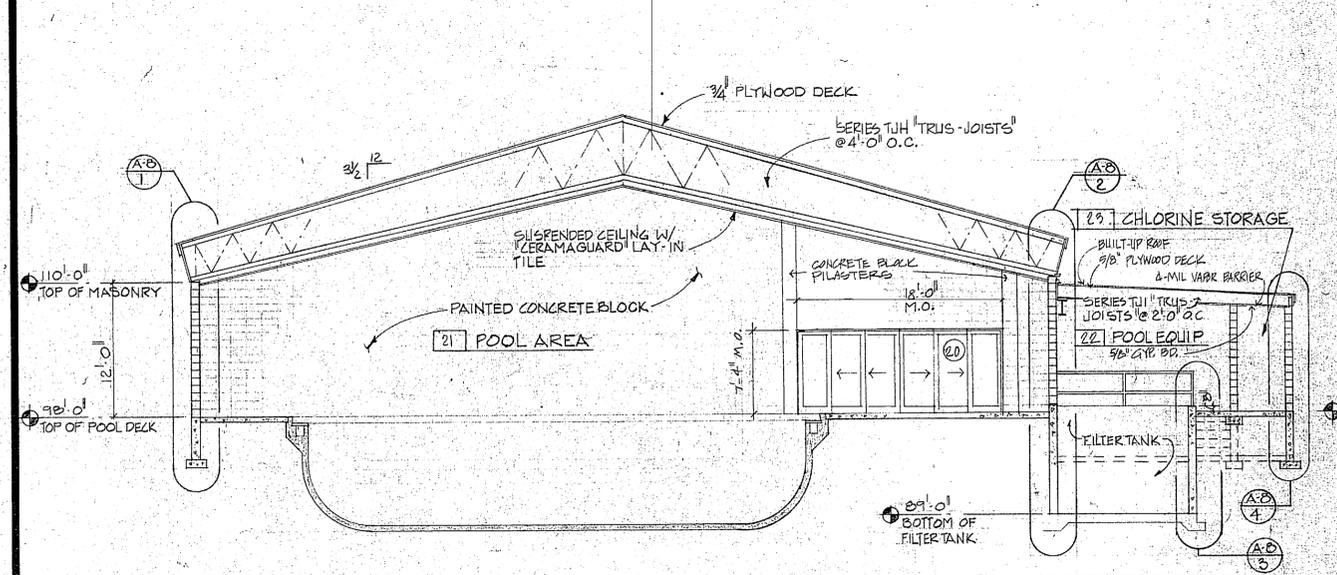


(1) BUILDING SECTION - ALTERNATE #1

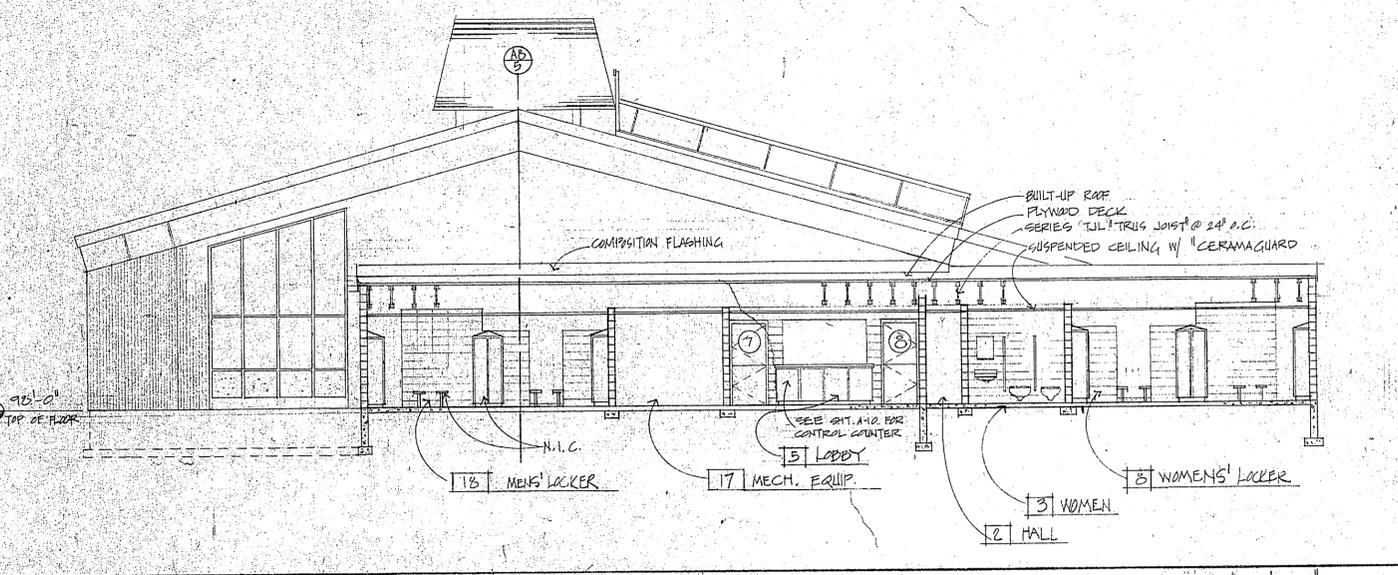
(5) CORRIDOR SECTION



(2) LONGITUDINAL BUILDING SECTION



(3) BUILDING SECTION - BASE BID

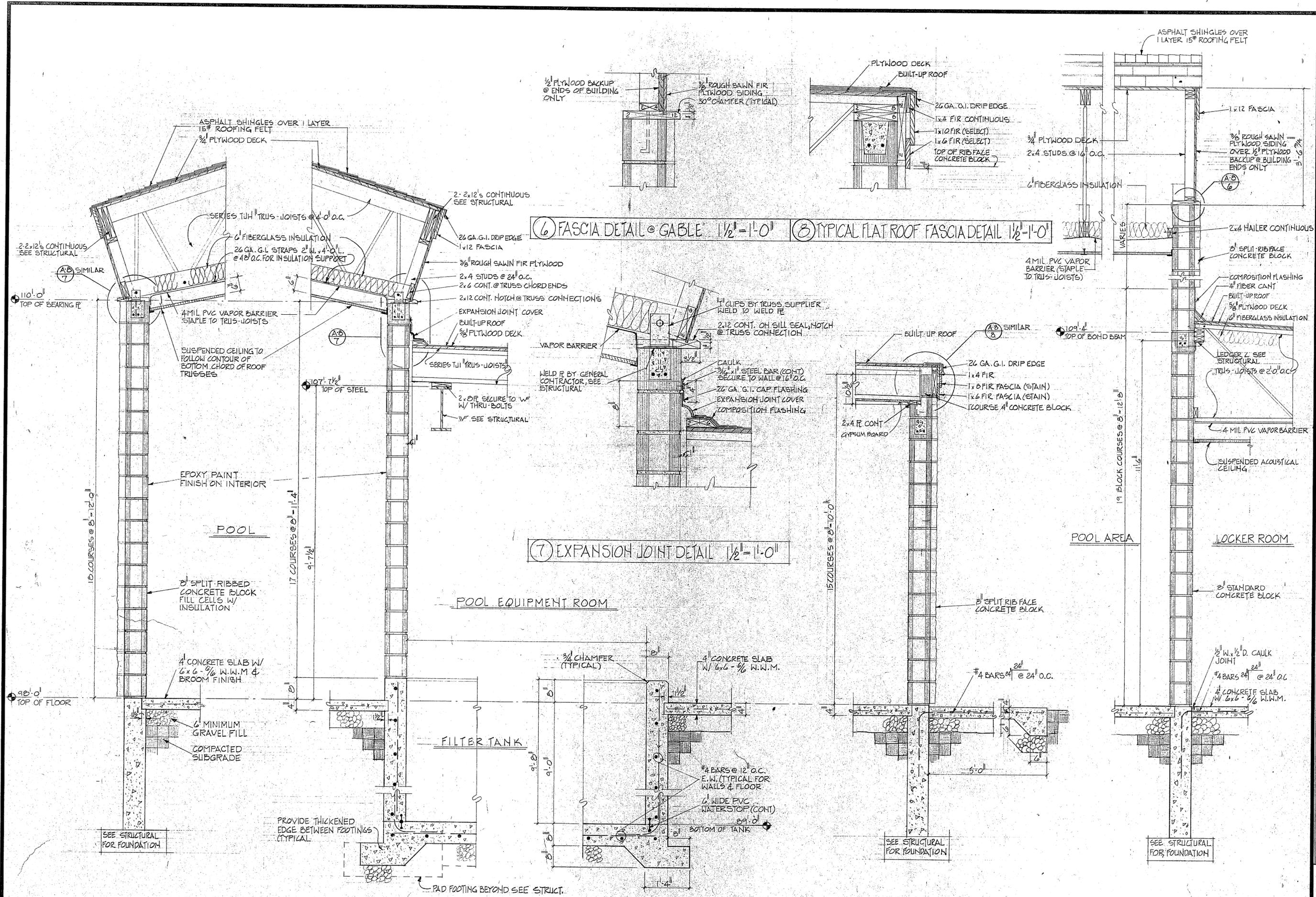


(4) BUILDING SECTION THRU LOCKER ROOMS

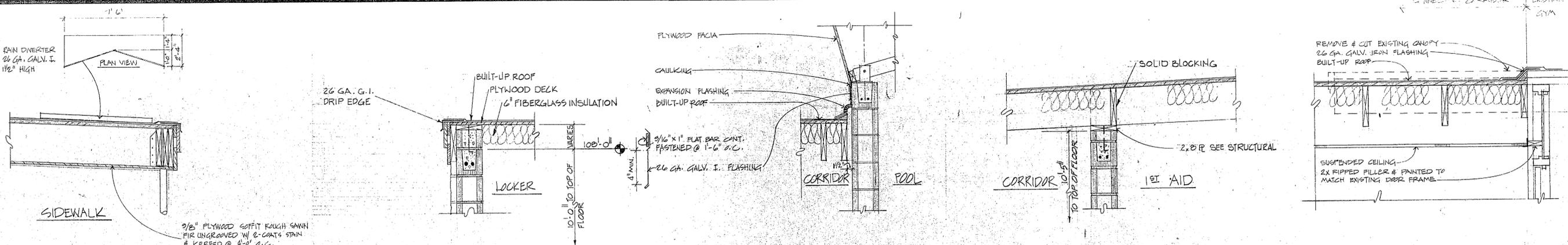
ENGINEER  
 CITY OF BOZEMAN, MONTANA  
 BOZEMAN MUNICIPAL POOL  
 BUILDING SECTIONS  
 SHEET NUMBER  
 DETAIL NUMBER  
 DRAWING MAY BE REPRODUCED FOR THE PROJECT ONLY. ALL MATERIALS AND METHODS SHALL BE AS SHOWN UNLESS OTHERWISE SPECIFIED. REVISIONS SHALL BE INDICATED BY CIRCLED NUMBERS AND LETTERS. REVISIONS SHALL BE MADE ACCORDING TO THE REVISIONS LISTED ON THIS SHEET. OTHERWISE, THE ORIGINAL DRAWING SHALL BE USED.

OWNER  
 CITY OF BOZEMAN, MONTANA  
 PROJECT  
 BOZEMAN MUNICIPAL POOL  
 SHEET  
 BUILDING SECTIONS

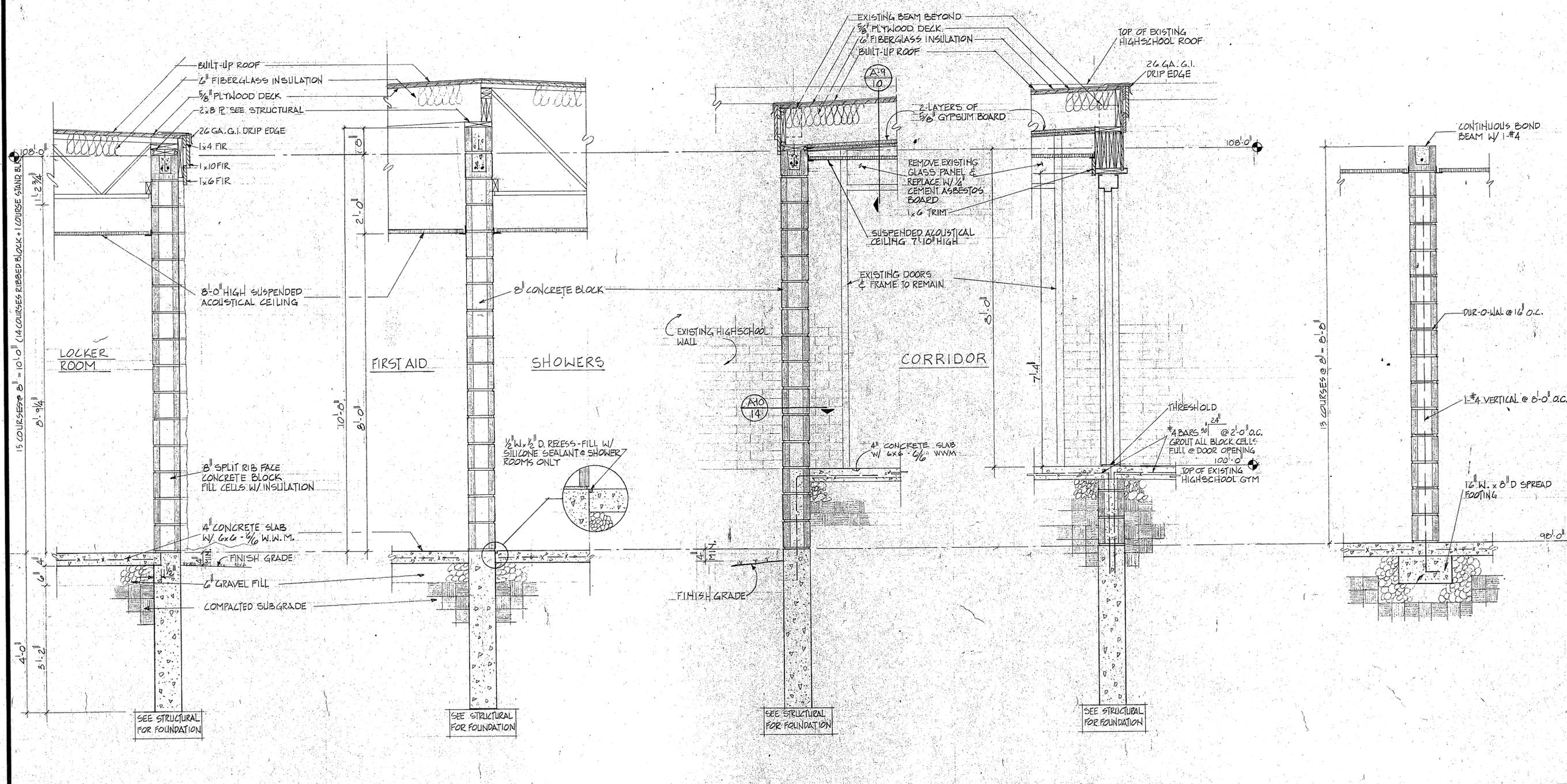
BERG-GRABOW & PARTNERS  
 ARCHITECTS-ENGINEERS-PLANNING CONSULTANTS  
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(1) SECTION THRU WEST WALL @ POOL 3/4" = 1'-0" (2) SECTION THRU EAST WALL @ POOL 3/4" = 1'-0" (3) SECTION THRU FILTER TANK WALL 3/4" = 1'-0" (4) SECTION THRU POOL EQUIP EAST WALL 3/4" = 1'-0" (5) SECTION THRU LOCKER ROOM NORTH WALL 3/4" = 1'-0"

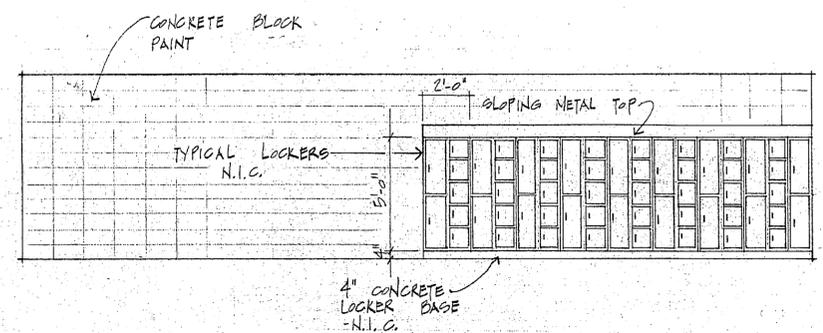


(6) OVERHANG-EAVE DETAIL 3/4" (7) WEST WALL-ROOF DETAIL 3/4" (8) FLASHING DETAIL 3/4" (9) BEARIN' WALL DETAIL 3/4" (10) ROOF DETAIL 3/4"

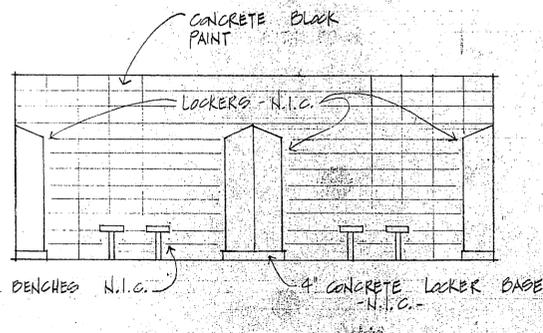


(1) SOUTH WALL @ LOCKER ROOMS 3/4"=1'-0" (2) NORTH WALL @ LOCKER ROOM 3/4"=1'-0" (3) NORTH WALL @ CONNECTING CORRIDOR 3/4"=1'-0" (4) SOUTH WALL @ CONNECTING CORRIDOR 3/4"=1'-0" (5) TYPICAL INTERIOR PARTITION 3/4"=1'-0"

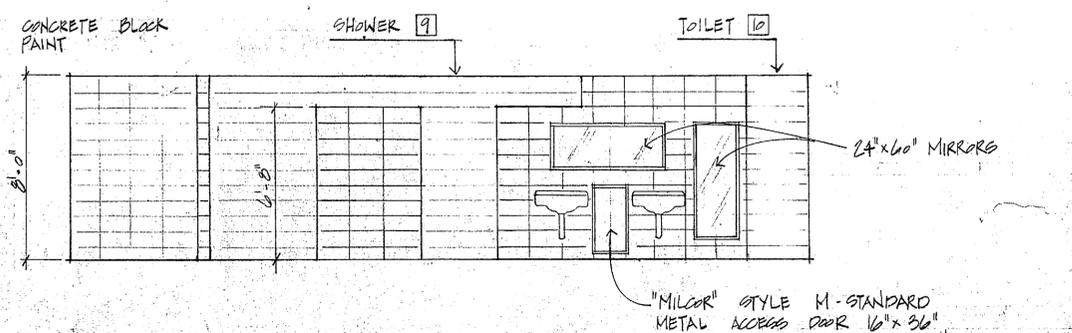




NOTE - WEST WALL MENS LOCKER ROOM SIMILAR



NOTE - SOUTH WALL - MENS LOCKER ROOM - SIMILAR

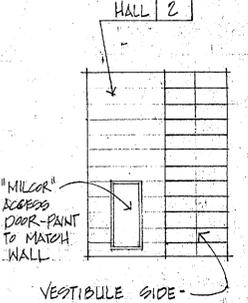
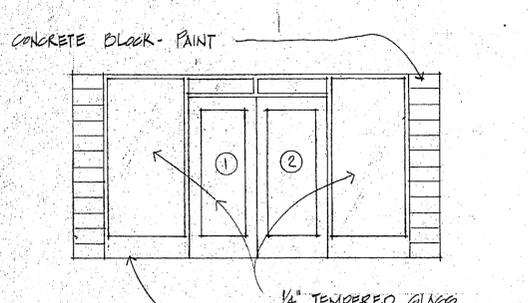
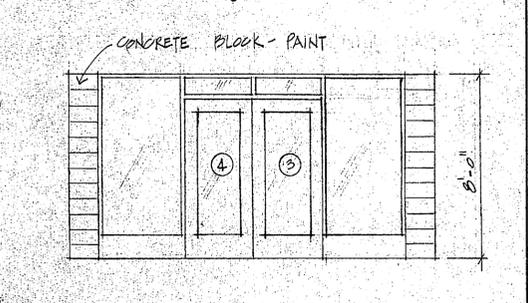
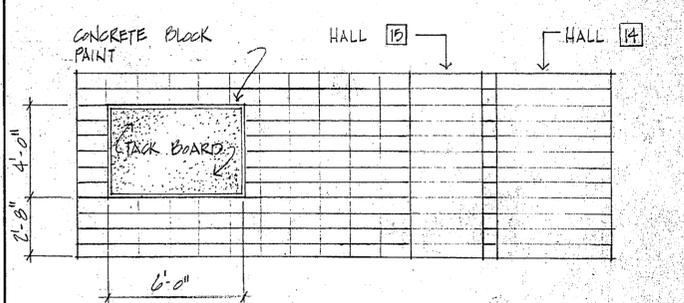
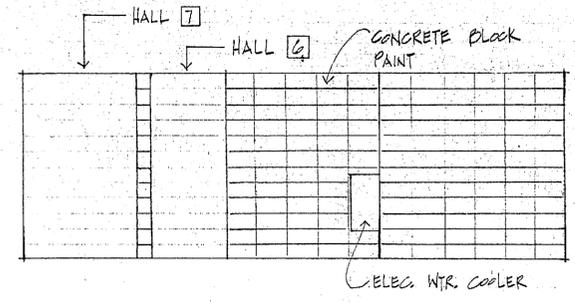


NOTE - NORTH WALL - MENS LOCKER ROOM - SIMILAR

① EAST WALL - WOMENS LOCKER ROOM [8]

② SOUTH WALL - WOMENS LOCKER ROOM [8]

③ NORTH WALL - WOMENS LOCKER ROOM [8]



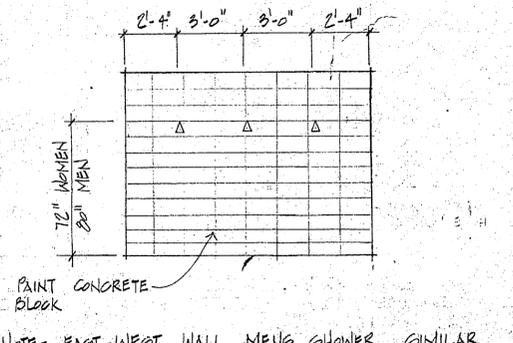
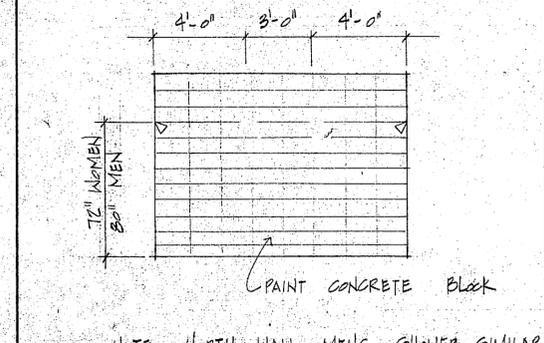
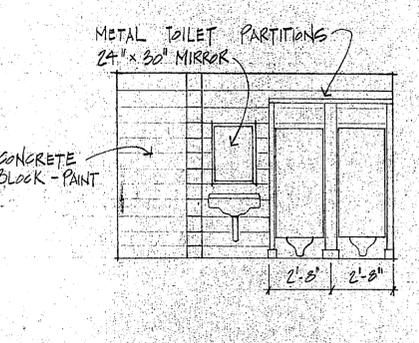
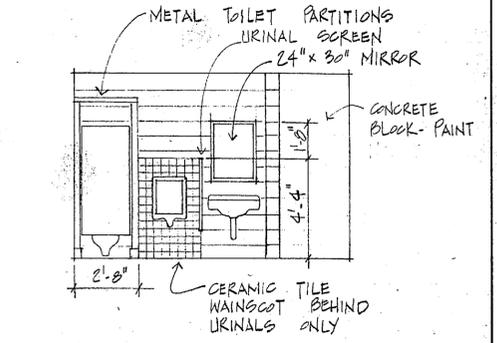
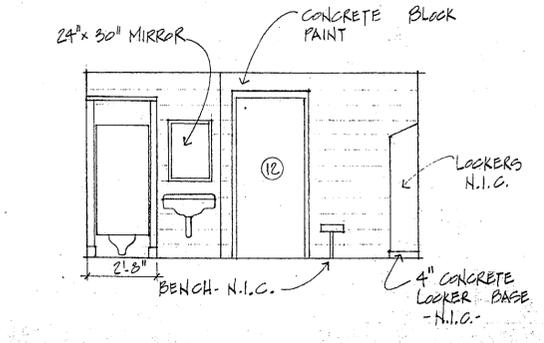
④ EAST WALL - LOBBY [5]

⑤ WEST WALL - LOBBY [5]

⑥ NORTH WALL - VESTIBULE

⑦ SOUTH WALL - VESTIBULE

⑧ VESTIBULE



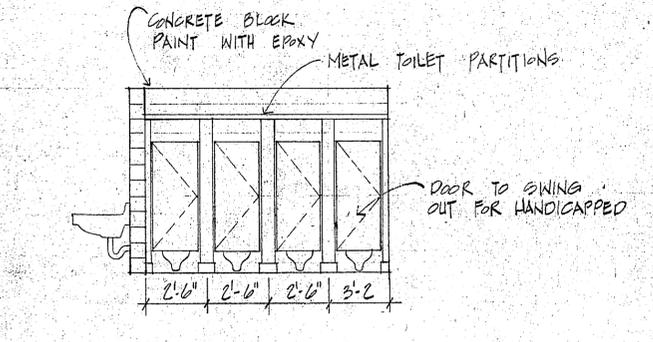
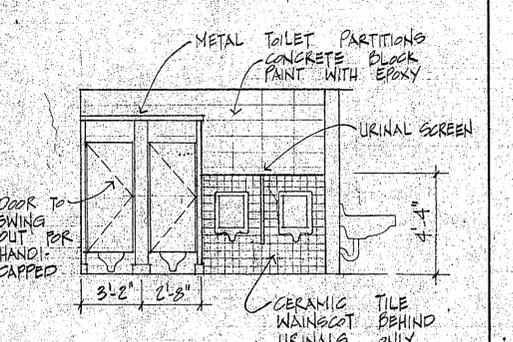
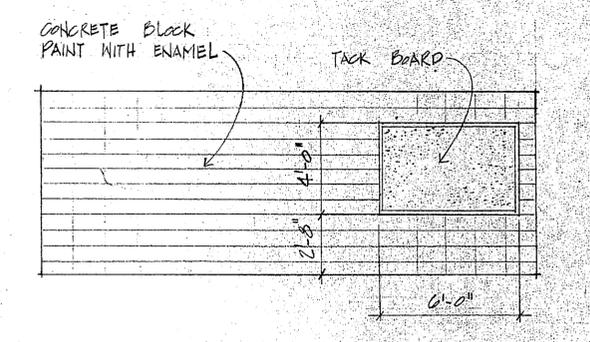
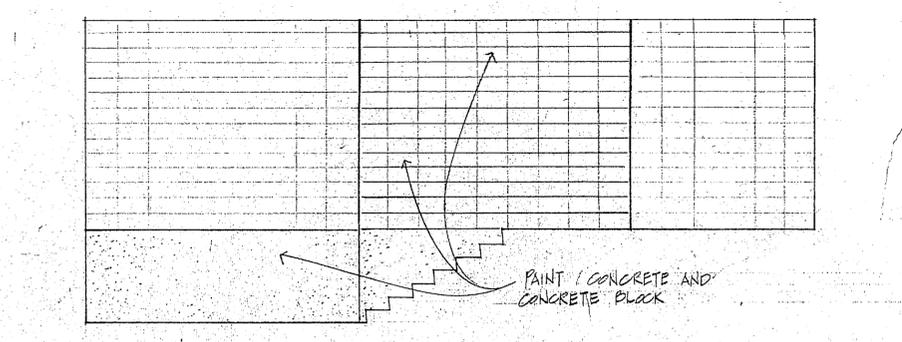
⑨ WEST WALL - LIFEGUARD [11]

⑩ SOUTH WALL - MEN [4]

⑪ NORTH WALL - WOMEN [3]

⑫ N. WALL - WOMEN - SHOWER

⑬ E.-W. WALL - WOMEN - SHOWER



⑭ EAST WALL - POOL EQUIPMENT RM. [22]

⑮ SO. WALL - FIRST AID [12]

⑯ EAST WALL - MEN [20]

⑰ WEST WALL - WOMEN [10]

ENGINEER  
 SHEET NUMBER  
 DETAIL NUMBER  
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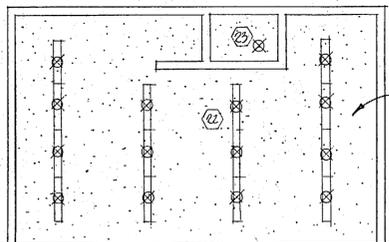
OWNER CITY OF BOZEMAN, MONTANA  
 PROJECT BOZEMAN MUNICIPAL POOL  
 SHEET INTERIOR ELEVATIONS

BERG-GRABOW & PARTNERS  
 ARCHITECTS-ENGINEERS-PLANNING CONSULTANTS  
 bozeman montana

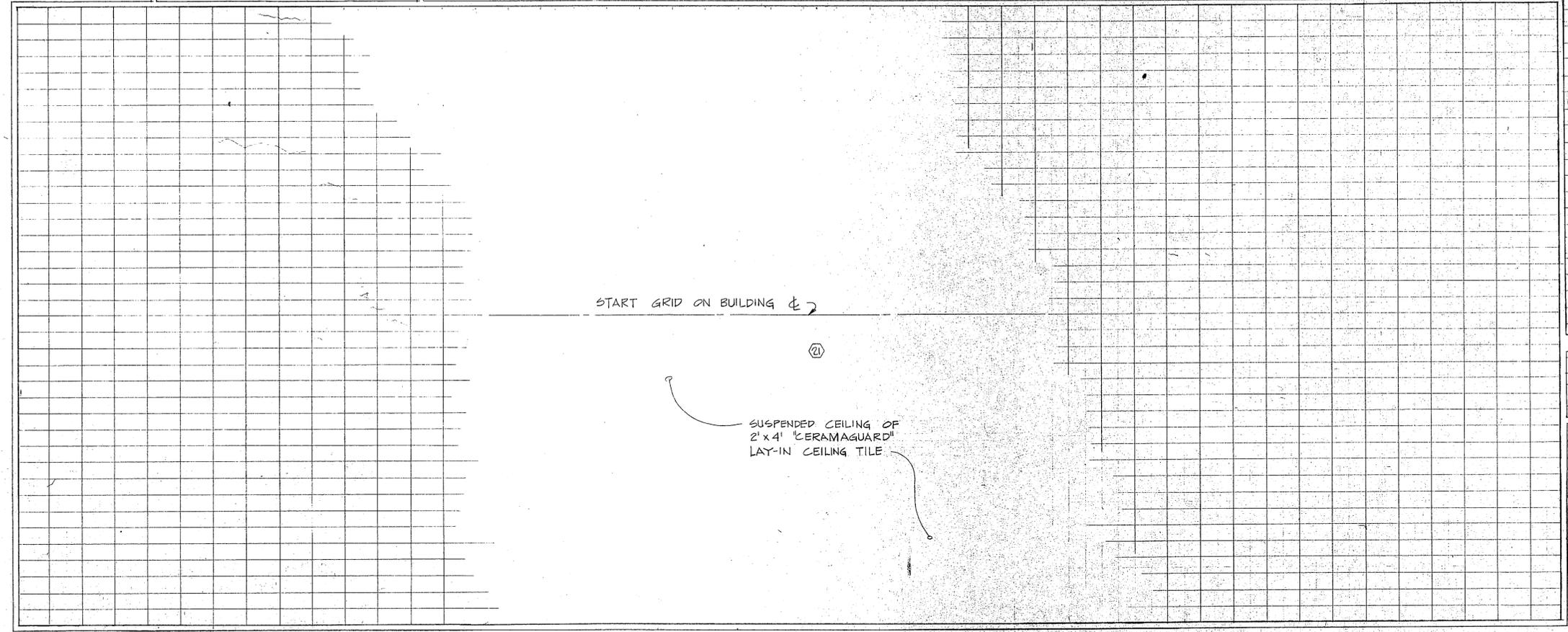
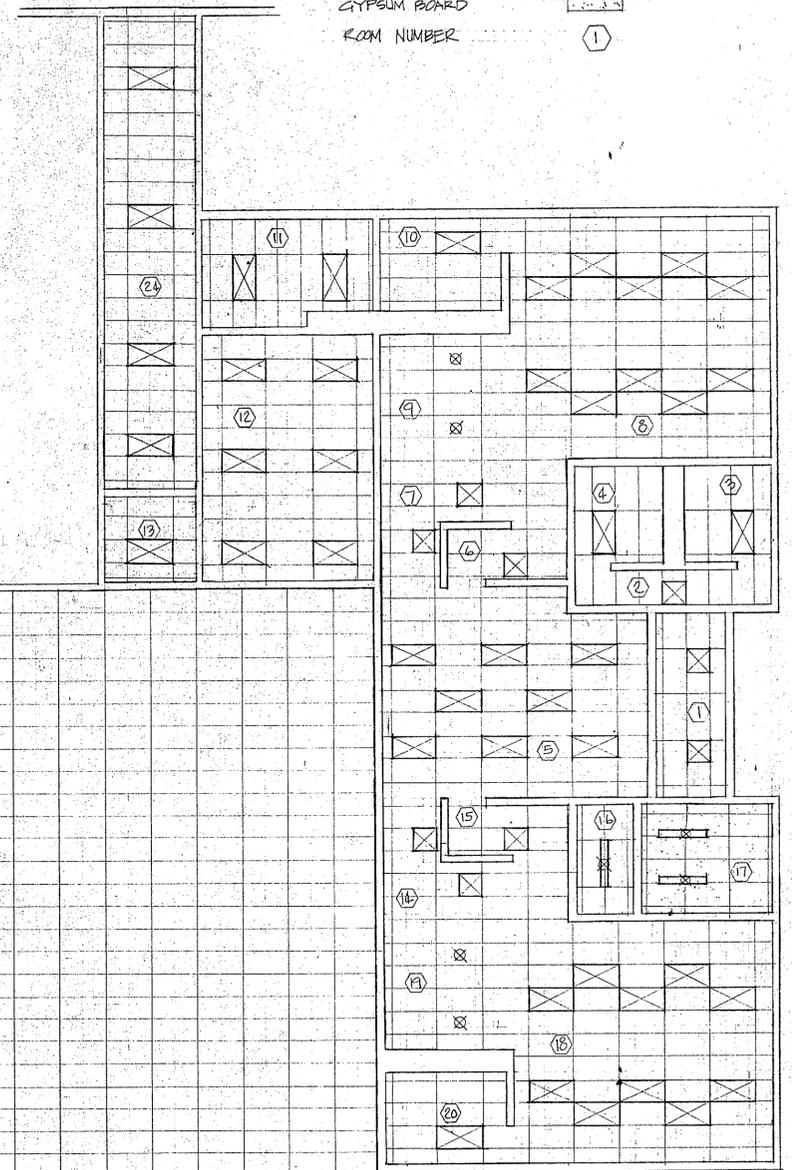


**LEGEND**

- RECESS LIGHT FIXTURE 
- SURFACE MOUNTED FIXTURE  OR 
- LAY-IN CEILING TILE 
- GYP. BOARD 
- ROOM NUMBER 

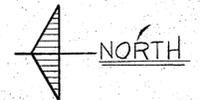


5/8" GYP. BOARD CEILING  
OVER THESE AREAS



START GRID ON BUILDING CL

SUSPENDED CEILING OF  
2' x 4' CERAMAGUARD<sup>®</sup>  
LAY-IN CEILING TILE



DRAWING MAY BE  
REPRODUCED FOR  
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ALL MATERIALS AND  
METHODS OF CONSTRUCTION  
SHOWN ARE NOT SHOWN  
HEREIN. CONSULT THE  
DRAWING FOR ALL  
RECOMMENDATIONS  
OTHERWISE  
Drawn by

ENGINEER

SHEET NUMBER  
DETAIL NUMBER

OWNER CITY OF BOZEMAN, MONTANA

PROJECT BOZEMAN MUNICIPAL POOL

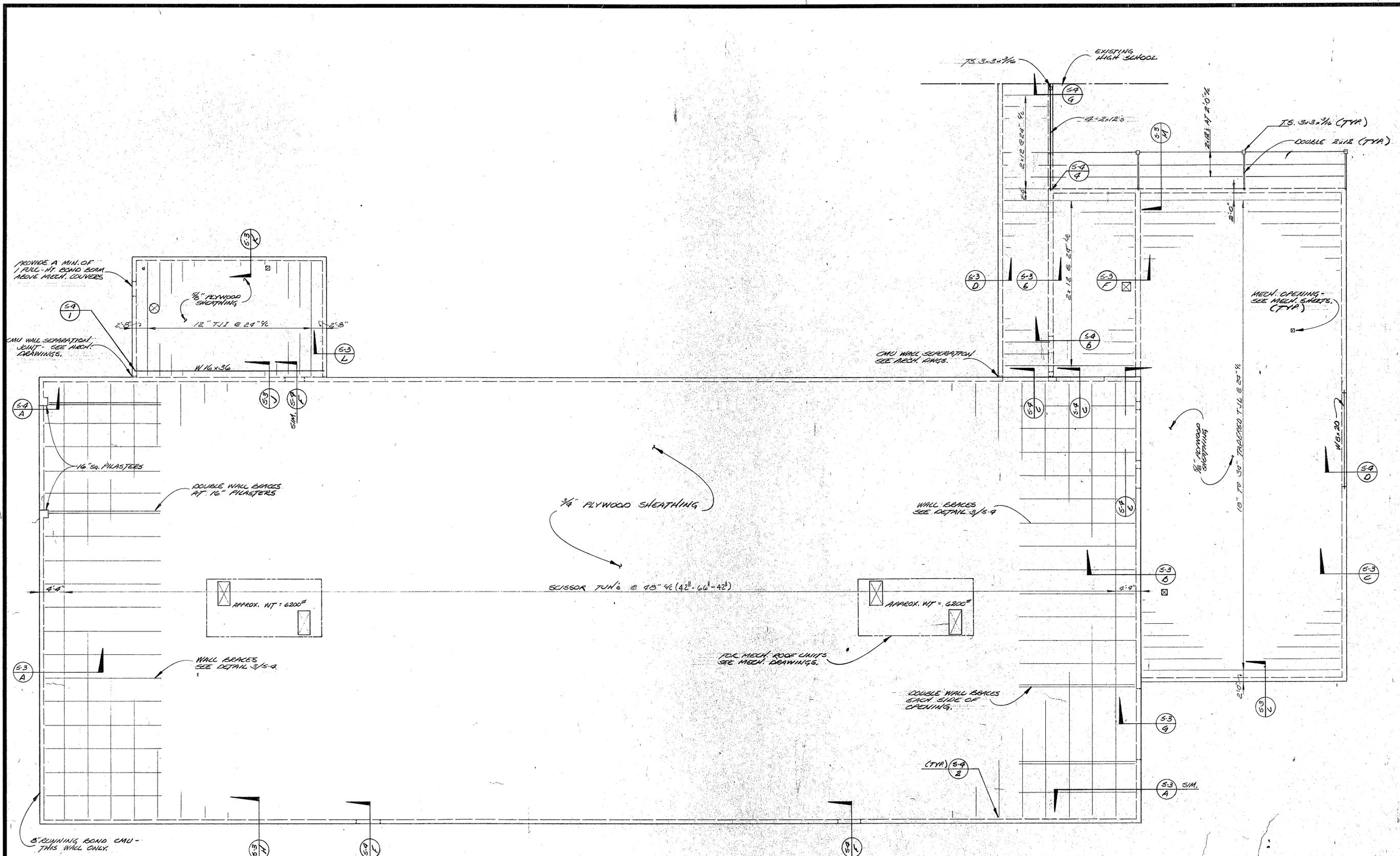
SHEET REFLECTED CEILING PLAN

**BERG-GRABOW & PARTNERS**  
ARCHITECTS-ENGINEERS-PLANNING CONSULTANTS  
bozeman montana

JOB NO. 7407  
DEC. 1974

**A-12**  
OF 12





PROVIDE A MIN. OF 1" FULL-HT. BOND BEAM ABOVE MECH. COVERS

CMU WALL SEPARATION JOINT - SEE MECH. DRAWINGS.

12" TJI @ 24" OC

W 16x36

2'-5"

2'-5"

5-3 L

5-3 M

5-3 N

5-3 O

5-3 P

5-3 Q

5-3 R

5-3 S

5-3 T

5-3 U

5-3 V

5-3 W

5-3 X

5-3 Y

5-3 Z

5-3 AA

5-3 AB

5-3 AC

5-3 AD

5-3 AE

5-3 AF

5-3 AG

5-3 AH

5-3 AI

5-3 AJ

5-3 AK

5-3 AL

5-3 AM

5-3 AN

5-3 AO

5-3 AP

5-3 AQ

5-3 AR

5-3 AS

5-3 AT

5-3 AU

5-3 AV

5-3 AW

5-3 AX

5-3 AY

5-3 AZ

5-3 BA

5-3 BB

5-3 BC

5-3 BD

5-3 BE

5-3 BF

5-3 BG

5-3 BH

5-3 BI

5-3 BJ

5-3 BK

5-3 BL

5-3 BM

5-3 BN

5-3 BO

5-3 BP

5-3 BQ

5-3 BR

5-3 BS

5-3 BT

5-3 BU

5-3 BV

5-3 BW

5-3 BX

5-3 BY

5-3 BZ

5-3 CA

5-3 CB

5-3 CC

5-3 CD

5-3 CE

5-3 CF

5-3 CG

5-3 CH

5-3 CI

5-3 CJ

5-3 CK

5-3 CL

5-3 CM

5-3 CN

5-3 CO

5-3 CP

5-3 CQ

5-3 CR

5-3 CS

5-3 CT

5-3 CU

5-3 CV

5-3 CW

5-3 CX

5-3 CY

5-3 CZ

5-3 DA

5-3 DB

5-3 DC

5-3 DD

5-3 DE

5-3 DF

5-3 DG

5-3 DH

5-3 DI

5-3 DJ

5-3 DK

5-3 DL

5-3 DM

5-3 DN

5-3 DO

5-3 DP

5-3 DQ

5-3 DR

5-3 DS

5-3 DT

5-3 DU

5-3 DV

5-3 DW

5-3 DX

5-3 DY

5-3 DZ

5-3 EA

5-3 EB

5-3 EC

5-3 ED

5-3 EE

5-3 EF

5-3 EG

5-3 EH

5-3 EI

5-3 EJ

5-3 EK

5-3 EL

5-3 EM

5-3 EN

5-3 EO

5-3 EP

5-3 EQ

5-3 ER

5-3 ES

5-3 ET

5-3 EU

5-3 EV

5-3 EW

5-3 EX

5-3 EY

5-3 EZ

5-3 FA

5-3 FB

5-3 FC

5-3 FD

5-3 FE

5-3 FF

5-3 FG

5-3 FH

5-3 FI

5-3 FJ

5-3 FK

5-3 FL

5-3 FM

5-3 FN

5-3 FO

5-3 FP

5-3 FQ

5-3 FR

5-3 FS

5-3 FT

5-3 FU

5-3 FV

5-3 FW

5-3 FX

5-3 FY

5-3 FZ

5-3 GA

5-3 GB

5-3 GC

5-3 GD

5-3 GE

5-3 GF

5-3 GG

5-3 GH

5-3 GI

5-3 GJ

5-3 GK

5-3 GL

5-3 GM

5-3 GN

5-3 GO

5-3 GP

5-3 GQ

5-3 GR

5-3 GS

5-3 GT

5-3 GU

5-3 GV

5-3 GW

5-3 GX

5-3 GY

5-3 GZ

5-3 HA

5-3 HB

5-3 HC

5-3 HD

5-3 HE

5-3 HF

5-3 HG

5-3 HH

5-3 HI

5-3 HJ

5-3 HK

5-3 HL

5-3 HM

5-3 HN

5-3 HO

5-3 HP

5-3 HQ

5-3 HR

5-3 HS

5-3 HT

5-3 HU

5-3 HV

5-3 HW

5-3 HX

5-3 HY

5-3 HZ

5-3 IA

5-3 IB

5-3 IC

5-3 ID

5-3 IE

5-3 IF

5-3 IG

5-3 IH

5-3 II

5-3 IJ

5-3 IK

5-3 IL

5-3 IM

5-3 IN

5-3 IO

5-3 IP

5-3 IQ

5-3 IR

5-3 IS

5-3 IT

5-3 IU

5-3 IV

5-3 IW

5-3 IX

5-3 IY

5-3 IZ

5-3 JA

5-3 JB

5-3 JC

5-3 JD

5-3 JE

5-3 JF

5-3 JG

5-3 JH

5-3 JI

5-3 JJ

5-3 JK

5-3 JL

5-3 JM

5-3 JN

5-3 JO

5-3 JP

5-3 JQ

5-3 JR

5-3 JS

5-3 JT

5-3 JU

5-3 JV

5-3 JW

5-3 JX

5-3 JY

5-3 JZ

5-3 KA

5-3 KB

5-3 KC

5-3 KD

5-3 KE

5-3 KF

5-3 KG

5-3 KH

5-3 KI

5-3 KJ

5-3 KL

5-3 KM

5-3 KN

5-3 KO

5-3 KP

5-3 KQ

5-3 KR

5-3 KS

5-3 KT

5-3 KU

5-3 KV

5-3 KW

5-3 KX

5-3 KY

5-3 KZ

5-3 LA

5-3 LB

5-3 LC

5-3 LD

5-3 LE

5-3 LF

5-3 LG

5-3 LH

5-3 LI

5-3 LJ

5-3 LK

5-3 LL

5-3 LM

5-3 LN

5-3 LO

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5-3 LT

5-3 LU

5-3 LV

5-3 LW

5-3 LX

5-3 LY

5-3 LZ

5-3 MA

5-3 MB

5-3 MC

5-3 MD

5-3 ME

5-3 MF

5-3 MG

5-3 MH

5-3 MI

5-3 MJ

5-3 MK

5-3 ML

5-3 MN

5-3 MO

5-3 MP

5-3 MQ

5-3 MR

5-3 MS

5-3 MT

5-3 MU

5-3 MV

5-3 MW

5-3 MX

5-3 MY

5-3 MZ

5-3 NA

5-3 NB

5-3 NC

5-3 ND

5-3 NE

5-3 NF

5-3 NG

5-3 NH

5-3 NI

5-3 NJ

5-3 NK

5-3 NL

5-3 NM

5-3 NN

5-3 NO

5-3 NP

5-3 NQ

5-3 NR

5-3 NS

5-3 NT

5-3 NU

5-3 NV

5-3 NW

5-3 NX

5-3 NY

5-3 NZ

5-3 OA

5-3 OB

5-3 OC

5-3 OD

5-3 OE

5-3 OF

5-3 OG

5-3 OH

5-3 OI

5-3 OJ

5-3 OK

5-3 OL

5-3 OM

5-3 ON

5-3 OO

5-3 OP

5-3 OQ

5-3 OR

5-3 OS

5-3 OT

5-3 OU

5-3 OV

5-3 OW

5-3 OX

5-3 OY

5-3 OZ

5-3 PA

5-3 PB

5-3 PC

5-3 PD

5-3 PE

5-3 PF

5-3 PG

5-3 PH

5-3 PI

5-3 PJ

5-3 PK

5-3 PL

5-3 PM

5-3 PN

5-3 PO

5-3 PP

5-3 PQ

5-3 PR

5-3 PS

5-3 PT

5-3 PU

5-3 PV

5-3 PW

5-3 PX

5-3 PY

5-3 PZ

5-3 QA

5-3 QB

5-3 QC

5-3 QD

5-3 QE

5-3 QF

5-3 QG

5-3 QH

5-3 QI

5-3 QJ

5-3 QK

5-3 QL

5-3 QM

5-3 QN

5-3 QO

5-3 QP

5-3 QQ

5-3 QR

5-3 QS

5-3 QT

5-3 QU

5-3 QV

5-3 QW

5-3 QX

5-3 QY

5-3 QZ

5-3 RA

5-3 RB

5-3 RC

5-3 RD

5-3 RE

5-3 RF

5-3 RG

5-3 RH

5-3 RI

5-3 RJ

5-3 RK

5-3 RL

5-3 RM

5-3 RN

5-3 RO

5-3 RP

5-3 RQ

5-3 RR

5-3 RS

5-3 RT

5-3 RU

5-3 RV

5-3 RW

5-3 RX

5-3 RY

5-3 RZ

5-3 SA

5-3 SB

5-3 SC

5-3 SD

5-3 SE

5-3 SF

5-3 SG

5-3 SH

5-3 SI

5-3 SJ

5-3 SK

5-3 SL

5-3 SM

5-3 SN

5-3 SO

5-3 SP

5-3 SQ

5-3 SR

5-3 SS

5-3 ST

5-3 SU

5-3 SV

5-3 SW

5-3 SX

5-3 SY

5-3 SZ

5-3 TA

5-3 TB

5-3 TC

5-3 TD

5-3 TE

5-3 TF

5-3 TG

5-3 TH

5-3 TI

5-3 TJ

5-3 TK

5-3 TL

5-3 TM

5-3 TN

5-3 TO

5-3 TP

5-3 TQ

5-3 TR

5-3 TS

5-3 TU

5-3 TV

5-3 TW

5-3 TX

5-3 TY

5-3 TZ

5-3 UA

5-3 UB

5-3 UC

5-3 UD

5-3 UE

5-3 UF

5-3 UG

5-3 UH

5-3 UI

5-3 UJ

5-3 UK

5-3 UL

5-3 UM

5-3 UN

5-3 UO

5-3 UP

5-3 UQ

5-3 UR

5-3 US

5-3 UT

5-3 UY

5-3 UZ

5-3 VA

5-3 VB

5-3 VC

5-3 VD

5-3 VE

5-3 VF

5-3 VG

5-3 VH

5-3 VI

5-3 VJ

5-3 VK

5-3 VL

5-3 VM

5-3 VN

5-3 VO

5-3 VP

5-3 VQ

5-3 VR

5-3 VS

5-3 VT

5-3 VU

5-3 VV

5-3 VW

5-3 VX

5-3 VY

5-3 VZ

5-3 WA

5-3 WB

5-3 WC

5-3 WD

5-3 WE

5-3 WF

5-3 WG

5-3 WH

5-3 WI

5-3 WJ

5-3 WK

5-3 WL

5-3 WM

5-3 WN

5-3 WO

5-3 WP

5-3 WQ

5-3 WR

5-3 WS

5-3 WT

5-3 WU

5-3 WV

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5-3 WX

5-3 WY

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5-3 XA

5-3 XB

5-3 XC

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5-3 XL

5-3 XM

5-3 XN

5-3 XO

5-3 XP

5-3 XQ

5-3 XR

5-3 XS

5-3 XT

5-3 XU

5-3 XV

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5-3 YA

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5-3 ZN

5-3 ZO

5-3 ZP

5-3 ZQ

5-3 ZR

5-3 ZS

5-3 ZT

5-3 ZU

5-3 ZV

5-3 ZW

5-3 ZX

5-3 ZY

5-3 ZZ

**JOIST NOTES:**

1. MANUFACTURER TO SUPPLY ALL BRIDGING AS REQUIRED, IN ADDITION TO THAT SHOWN IN DETAIL 3/S-9.
2. MANUFACTURER TO DESIGN JOISTS FOR M.E. UNITS AND OTHER SPECIAL LOADINGS AS REQUIRED.
3. SEE DETAIL 2/S-9 FOR ERECTION PROCEDURE.

**PLYWOOD SHEATHING NOTES:**

1. PLYWOOD SHEETS TO BE PLACED WITH FACE GRAIN RUNNING PERPENDICULAR TO JOISTS.
2. PLYWOOD SHEET JOINTS PARALLEL TO JOISTS TO BE STAGGERED.
3. NAILING:
  - A. ROOF AREA AND EQUIPMENT ROOM: 10d NAILS AT 6" OC AT ALL SUPPORTED EDGES AND AT 12" OC AT INTERMEDIATE SUPPORTS O.N.
  - B. EDGE WHERE: 8d NAILS AT 6" OC AT ALL SUPPORTED EDGES AND 12" OC AT INTERMEDIATE SUPPORTS.
4. ALL PLYWOOD PANEL EDGES OF THE ROOF OVER THE EXIST. BUILDING SHALL BE BLOCKED WITH 2x4 BLOCKING.

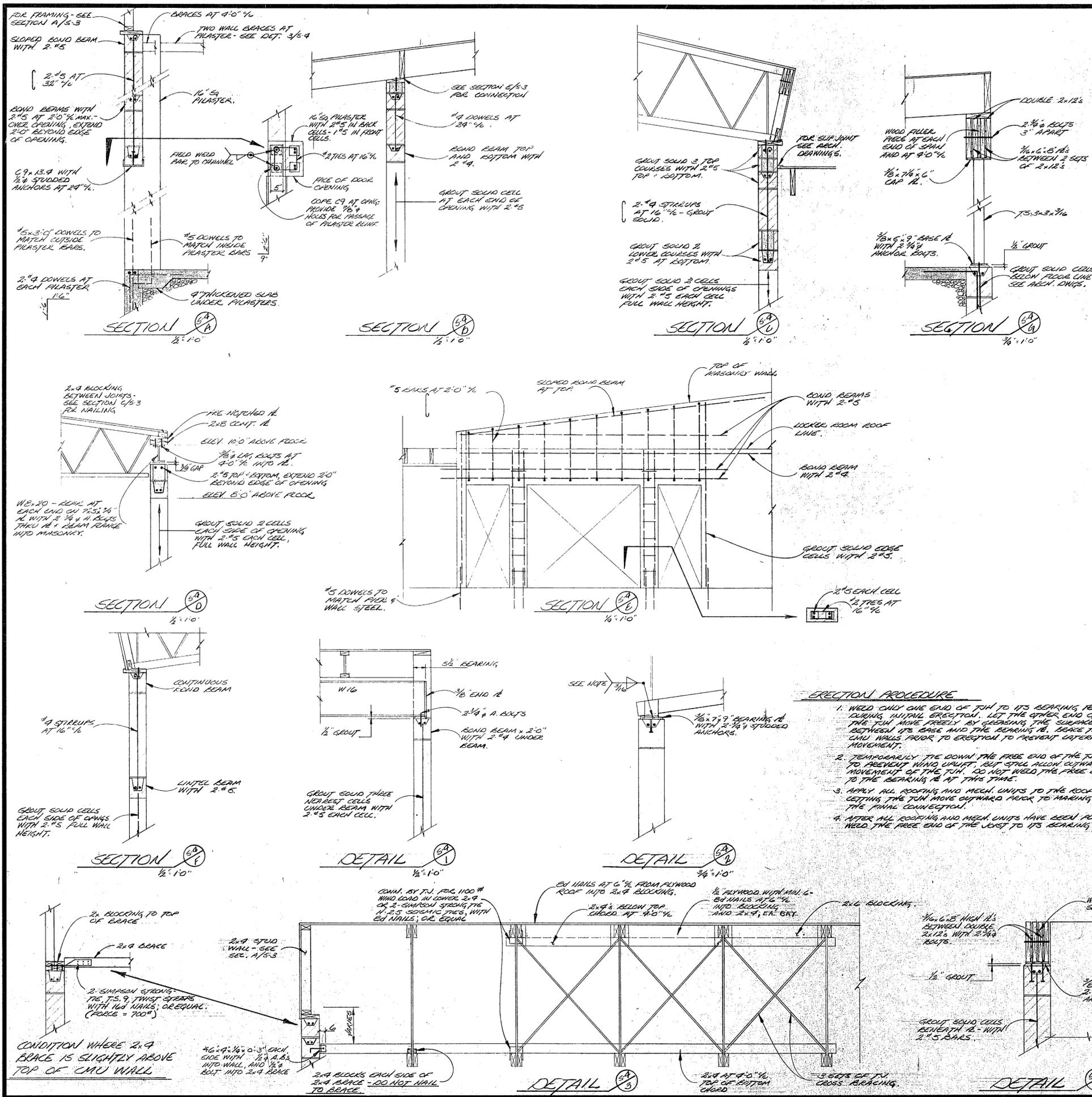
**ROOF PLAN - BASE BID**

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# GENERAL STRUCTURAL NOTES

- A. CONCRETE:**
1. All concrete to be prepared, formed, placed and cured as per ACI Codes or as specified.
  2. Minimum 28-day compressive strength for concrete to be 3000 psi.
  3. No water in addition to that specified for mix to be added at site unless approved.
  4. Pour stops to be made as directed with suitable bulkheads, reinforcing, & keys.
  5. Openings in concrete walls with a dimension of 1'-0" or greater in either direction not shown otherwise to have two #5 bars each side extending 2 feet beyond opening. Splices in rebar to lap 30 diameters, 12" minimum. Lap bars in corners and wall intersections. Tension splices as per ACI 318-71.
  6. Provide adequate support bars and accessories to hold rebar firmly in place.
  7. Minimum concrete cover over rebar and ties:
    - Footings - - - - - 3" inches
    - Walls - - - - - 1 1/2" inches or centered
    - Columns - - - - - 1 1/2" inches
- B. STRUCTURAL STEEL:**
1. All steel work per current edition of AISC Specifications. Minimum connections per AISC Spec's.
  2. All field bolts, field welds, exposed surfaces of steel embedded in concrete and all abrasions to coat of shop paint shall be spot painted with the material used for the shop coat or equivalent.
  3. No field welds to be made until the members have been properly aligned. Field welds to be made by certified welders using proper electrodes and amperage.
  4. Beams and columns shall be erected true and plumb. Temporary bracing shall be introduced wherever necessary to maintain such alignment or for support of temporary loads.
  5. All bolts connecting structural steel members to be ASTM A307 unless shown otherwise.
- C. FOUNDATIONS:**
1. All footings are designed for a maximum soil pressure of 6000 psf at the gravel layer. Depths to footings shown on plans are for bidding purposes only, and are to be embedded 1'-0" minimum into the gravel layer unless noted.
  2. Foundations and excavations to be protected from the action of water or freezing.
  3. All backfill to be placed strictly according to job specifications. Walls to be properly braced before backfill is placed.
  4. No concrete shall be placed without the approval of the Architect.
  5. If soils or other foundation conditions are found which vary from the conditions indicated on the soils boring logs or from conditions which may be reasonably expected, notify the Architect before proceeding with the work.
  6. Bring all over-excavation back to required grade as per specifications.
- D. TIMBER:**
1. Wood joists to be installed crown up. All members shall be stored and handled to prevent damage and excessive wetting.
  2. Plywood diaphragm, horizontal and vertical, to be attached as shown on drawings.
  3. Minimum framing details as per U.B.C. or as detailed, whichever is greater.
- E. MASONRY:**
1. All masonry work as per Uniform Building Code or as detailed, whichever is greater.
  2. See specifications for classes and types of masonry units and mortars to be used.
  3. Provide cleanouts at bottom of all cells to be grouted.
  4. Vertical reinforcing shall be held in position at top and bottom and at intervals not exceeding 8'-0".
  5. Grout shall not be poured in lifts greater than 4'-0".
  6. Protect masonry from freezing for 48 hours.
  7. Provide minimum 2-#5 grouted solid each side of all openings unless noted 24" or greater. Extend reinforcing minimum 24" beyond opening.
  8. Lap all bars at corners and wall intersections.
  9. Walls to be temporarily braced in a proper manner until permanent stability is provided.
  10. Reinforcing is to be centered in masonry unless shown otherwise.
  11. Where reinforcing is to be placed in hollow unit masonry, care shall be used to align successive layers of block so that the opening for the reinforcing shall be straight and clear.
- F. MISCELLANEOUS:**
1. Lateral Loads: Seismic Zone III (U.B.C.) or wind at 25 psf Basic (U.B.C.) on vertical, surface.
  2. Vertical Loads: Live Loads = 30 psf on roof.
  3. Refer to Mechanical and Electrical for openings and sleeves not shown. Check Architectural for inserts and embedded items. All openings or inserts to be installed prior to placing concrete.
  4. Provide headers, auxiliary framing as required for structural adequacy.
  5. Temporary bracing shall be adequate to resist lateral forces and hold members in proper alignment during construction.



STATE OF MONTANA  
O. Berg, Jr. - 200  
W.E. Grabow - 300  
P.A. Strohlied - 199  
BOZEMAN  
LICENSED ARCHITECTS

---

ENGINEER  
HURBUT - KERSICH - MC CULLOUGH

---

OWNER  
CITY OF BOZEMAN, MONTANA

---

PROJECT  
BOZEMAN MUNICIPAL POOL

---

SHEET  
STRUCTURAL - DETAILS - NOTES

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**BERG - GRABOW & PARTNERS**  
ARCHITECTS-ENGINEERS-PLANNING CONSULTANTS  
bozeman montana

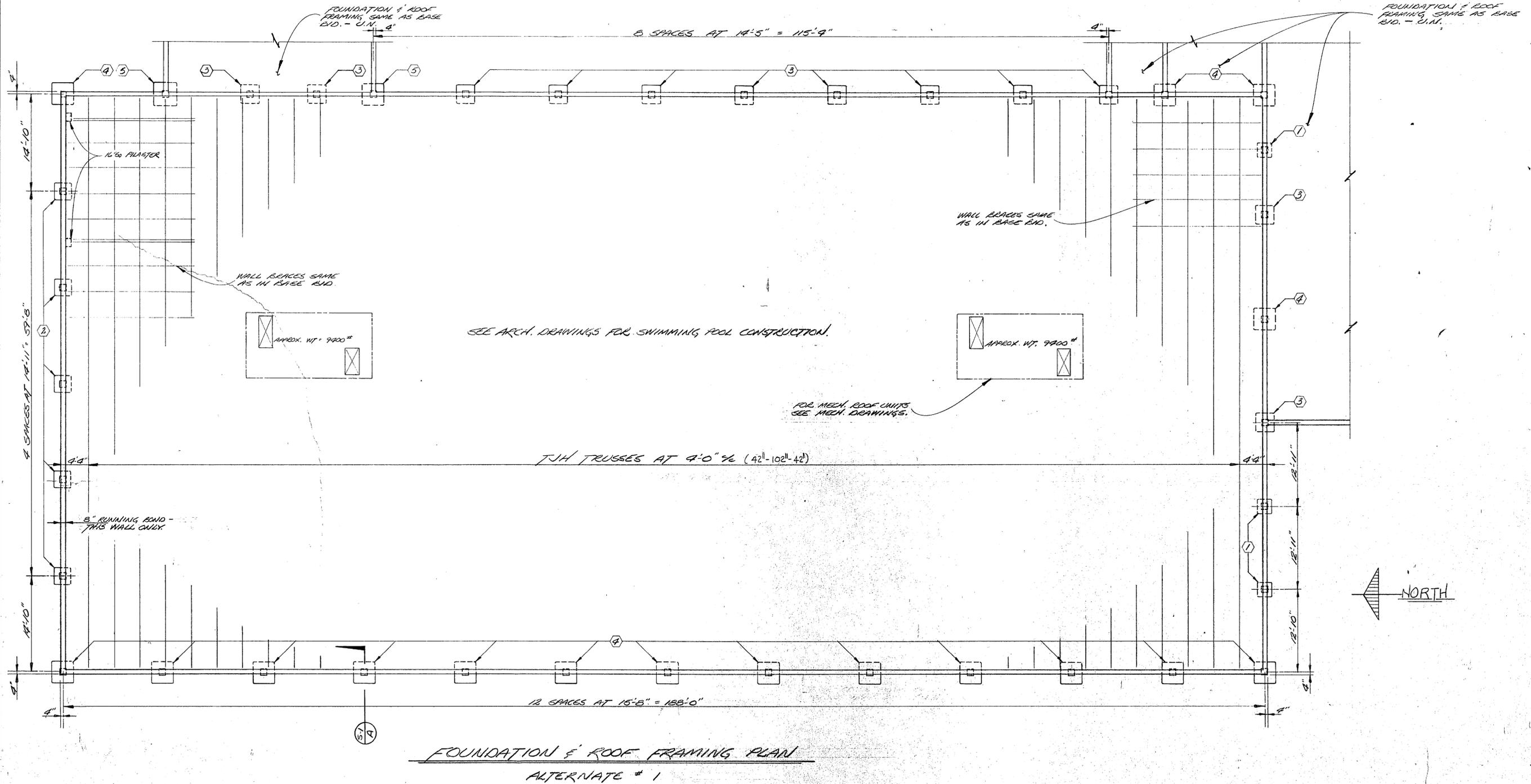
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JOB NO. 7407  
DEC. 1974  
S-4  
OF 5

PAD FOOTING SCHEDULE		
MARK	SIZE	REBAR
①	2'-9" Sq x 12"	3" #4 EACH WAY
②	2'-8" Sq x 12"	3" #4 EACH WAY
③	3'-0" Sq x 12"	4" #4 EACH WAY
④	3'-4" Sq x 12"	4" #5 EACH WAY
⑤	3'-8" Sq x 12"	4" #6 EACH WAY

NOTE:

- ALL SECTIONS SHOWN ON SHEETS 5-3 AND 5-4 ALSO APPLY TO THE ALTERNATE DESIGN U.N.
- T.J. TO DESIGN JOISTS FOR M.E. ROOF UNITS AS REQUIRED.
- ALL SLAB REINF., ROOF RAFTING, CAYOUT, AND BLOCKING, AND WALL BRACING AS SHOWN ON SHEETS 5-1 AND 5-2 SHALL BE SIMILARLY APPLIED TO THE ALTERNATE #1 U.N.



ENGINEER  
HULBUT - KERICH - NO COLLUUGH

OWNER  
CITY OF BOZEMAN, MONTANA

PROJECT  
BOZEMAN MUNICIPAL POOL

SHEET  
STRUCTURAL - FOUNDATION & ROOF FRAMING PLAN - ALTERNATE # 1

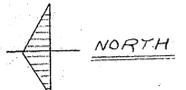
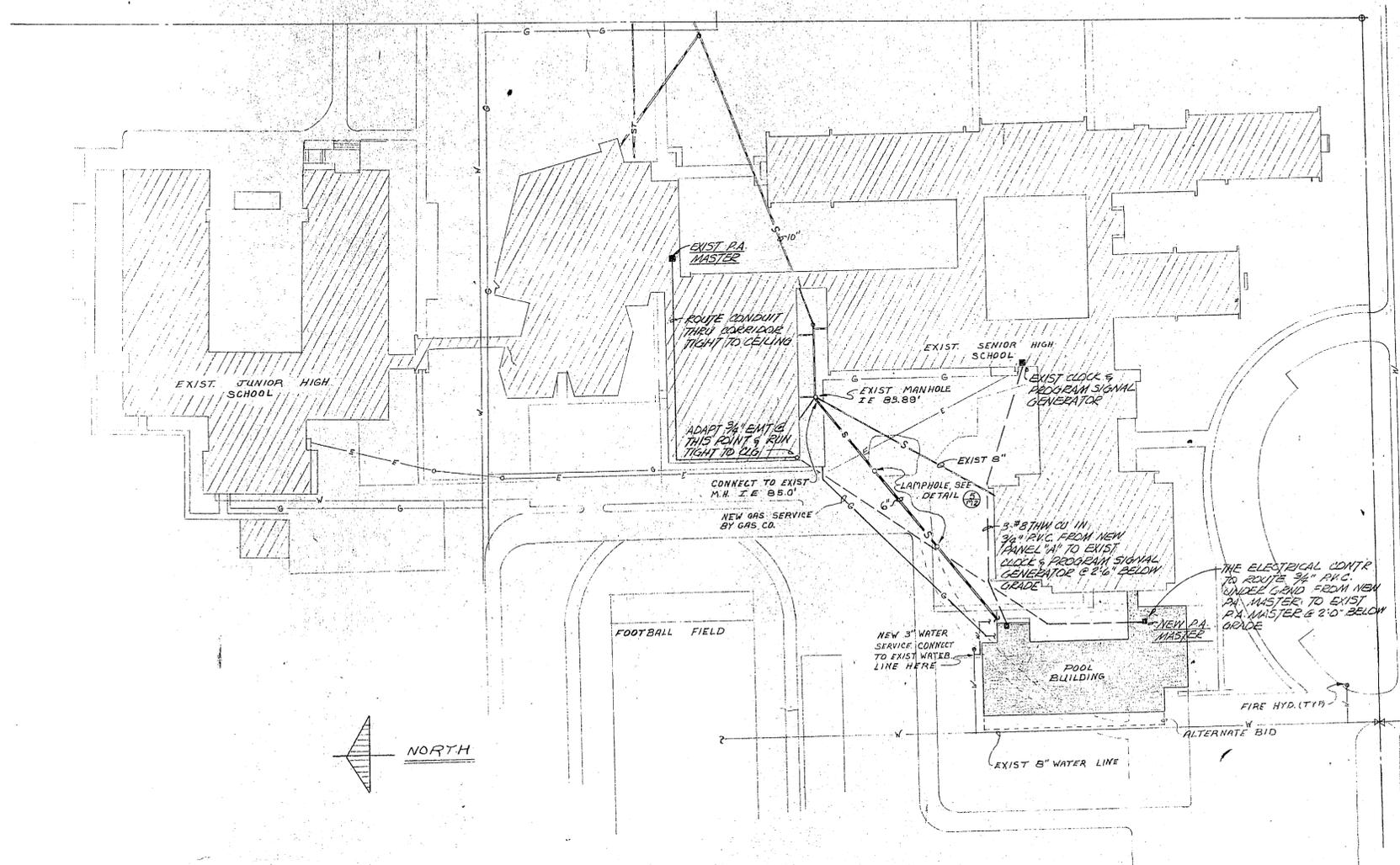
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DETAIL KEY

RECOMMENDATIONS UNLESS OTHERWISE INDICATED

**BERG-GRABOW & PARTNERS**  
ARCHITECTS-ENGINEERS-PLANNING CONSULTANTS  
bozeman montana

JOB NO. 7407  
DEC. 1974  
S-3  
OF 5

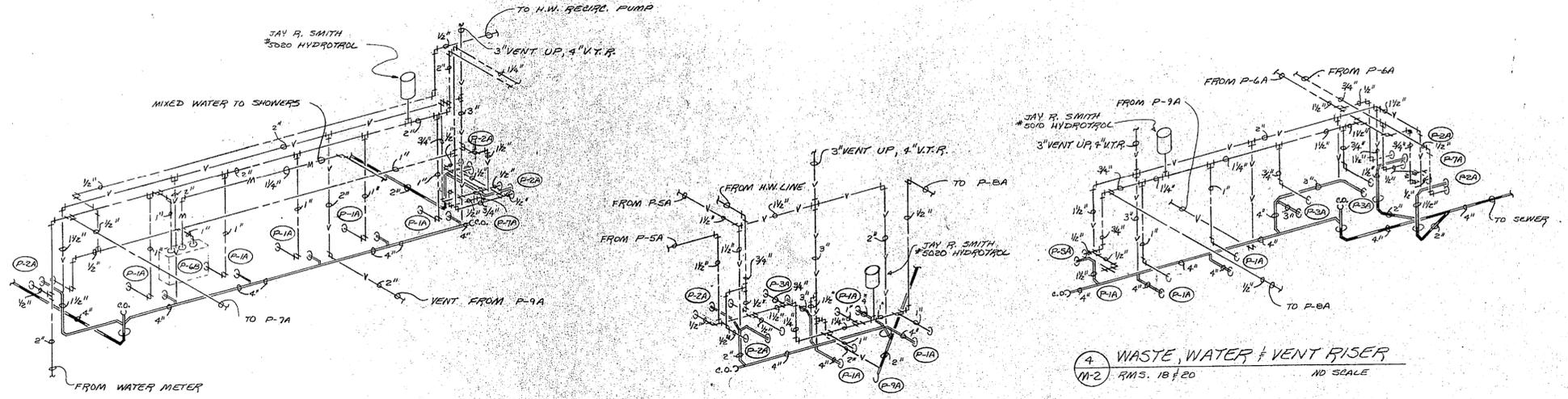


1  
ME1 SITE PLAN SCALE 1"=80'

JOB NO. 7407 DEC. 1974	<b>BERG-GRABOW &amp; PARTNERS</b> ARCHITECTS-ENGINEERS-PLANNING CONSULTANTS bozeman montana	
	OWNER CITY OF BOZEMAN, MONTANA	PROJECT BOZEMAN MUNICIPAL POOL
ENGINEER	SHEET ME SITE PLAN	
UNLESS SHOWN TO THE CONTRARY, ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED. EQUIPMENT SHALL BE TO MANUFACTURER'S UNLESS SPECIFIED OTHERWISE.		
SHEET NUMBER ME-1 OF 5		

PLUMBING FIXTURE SCHEDULE

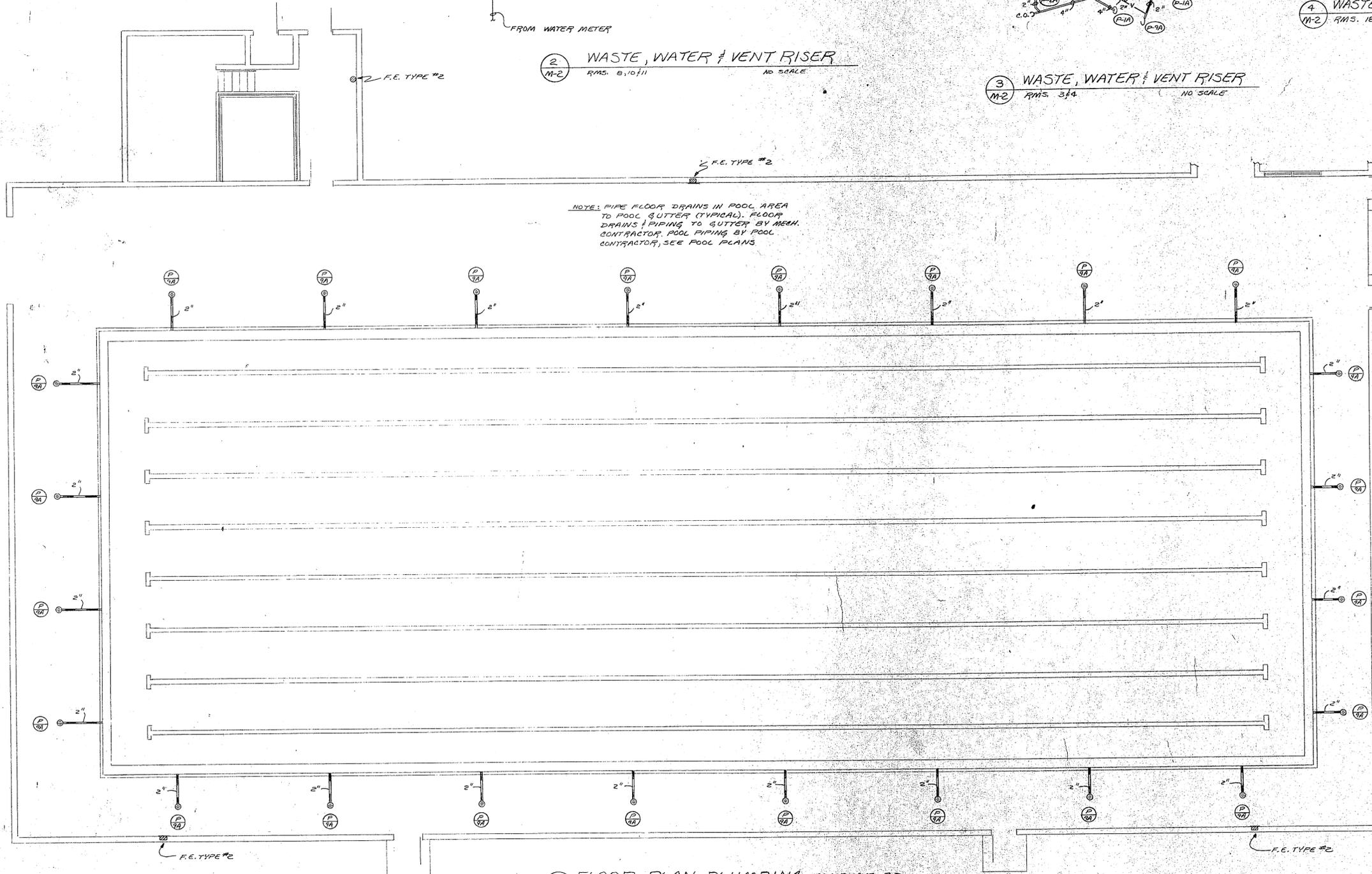
MARK	FIXTURE DESCRIPTION	PIPE SIZE (INCHES)				REMARKS
		CW	HW	WASTE	VENT	
P-1A	WATER CLOSET	1	-	4	2	WALL MOUNTED @ 15" TO RIM
P-1B	WATER CLOSET	1	-	4	2	HANDICAPPED, MT'D @ 18" TO RIM
P-2A	LAVATORY	1/2	1/2	1 1/2	1 1/2	MT'D @ 31" HANDICAPPED MT'D @ 32" BELOW 5TH OF RIM
P-3A	URINAL	3/4	-	3	1 1/2	MT'D @ 24"
P-4A	MOP BASIN	1/2	1/2	3	1 1/2	FLOOR MT'D.
P-5A	DRINKING FOUNTAIN	1/2	-	1 1/2	1 1/2	
P-6A	SHOWER	1/2	1/2	-	-	MT'D @ 6'-0"
P-7A	HOSE BIBB	1/2	-	-	-	
P-8A	WALL HYDRANT	1/2	-	-	-	MT'D @ 16" ABOVE GRADE
P-9A	FLOOR DRAIN	-	-	2	2	
P-9B	FLOOR DRAIN	-	-	6	3	
P-6B	SHOWER MIXER	1"	1"	-	-	CABINET MOUNTED



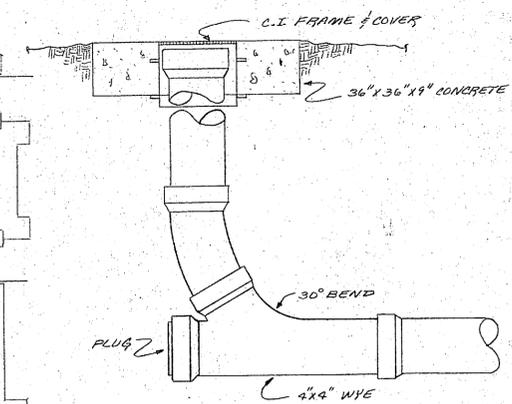
2 WASTE, WATER & VENT RISER  
M-2 R.M.S. 8, 10 & 11 NO SCALE

3 WASTE, WATER & VENT RISER  
M-2 R.M.S. 3 & 4 NO SCALE

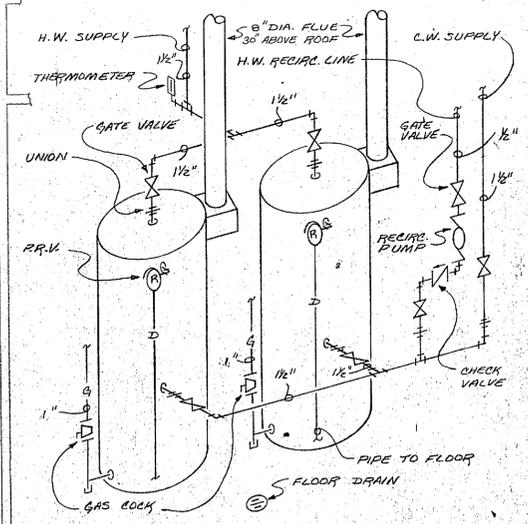
4 WASTE, WATER & VENT RISER  
M-2 R.M.S. 18 & 20 NO SCALE



1 FLOOR PLAN-PLUMBING - ALTERNATE BID  
M-2 SCALE: 1/8" = 1'-0"



5 LAMP HOLE DETAIL  
M-2 NO SCALE



6 WATER HEATER DETAIL  
M-2 R.M. 16 NO SCALE

**BERG GRABOW & PARTNERS**  
 ARCHITECTS-ENGINEERS-PLANNING CONSULTANTS  
**bozeman montana**

JOB NO. 7407  
 DEC. 1974  
 JOB NO. 7407  
 DEC. 1974  
 OF 5

ENGINEER: [Signature]  
 OWNER: CITY OF BOZEMAN, MONTANA  
 PROJECT: BOZEMAN MUNICIPAL POOL  
 SHEET: PLUMBING PLAN  
 M-2

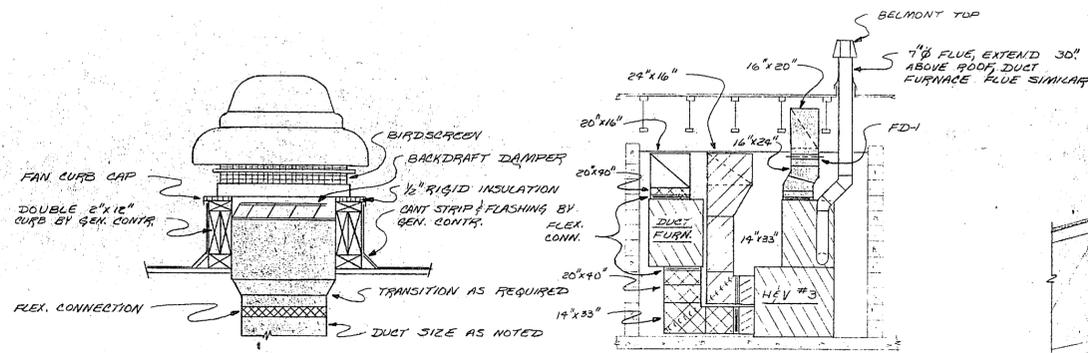


ENGINEER  
CITY OF BOZEMAN, MONTANA  
PROJECT BOZEMAN MUNICIPAL POOL  
SHEET HEATING & VENTILATING PLAN

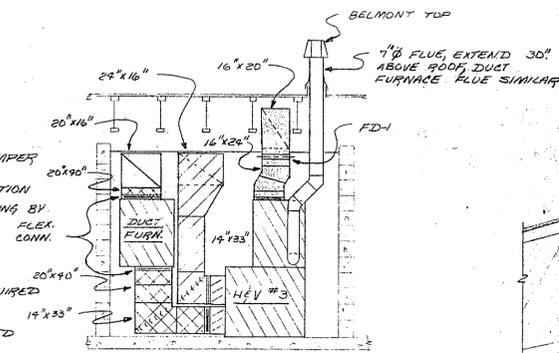
BOZEMAN MUNICIPAL POOL  
HEATING & VENTILATING PLAN

**BERG-GRABOW & PARTNERS**  
ARCHITECTS-ENGINEERS-PLANNING CONSULTANTS  
bozeman montana

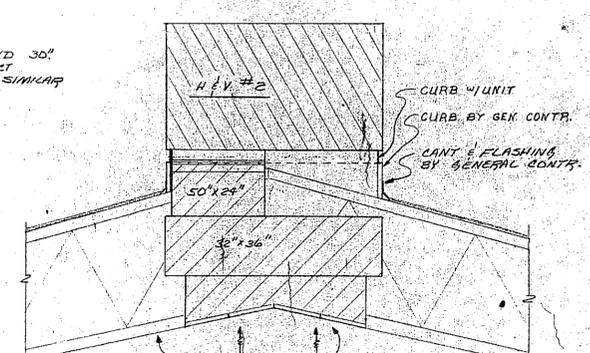
JOB NO. 7407  
DEC. 1974  
M-3  
OF 5



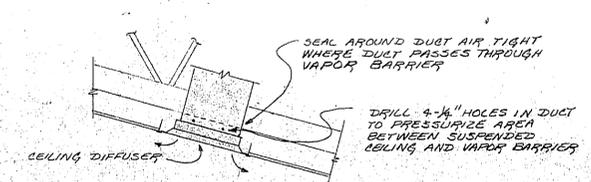
2 EXHAUST FAN DETAIL  
NO SCALE



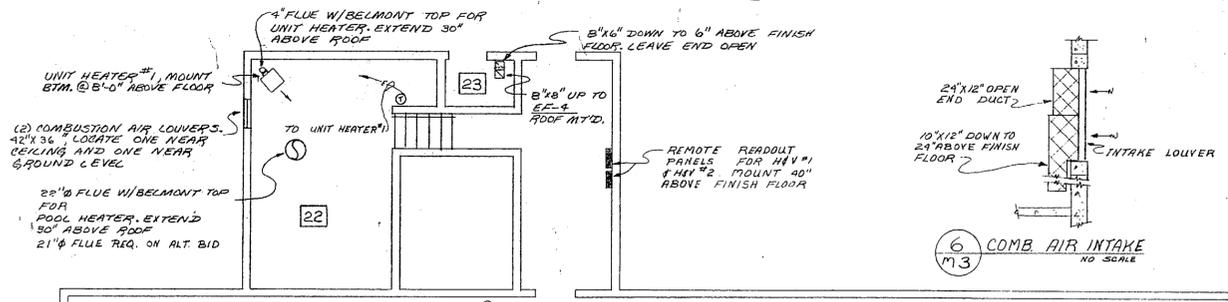
3 SECTION A-A  
SCALE: 1/4" = 1'-0"



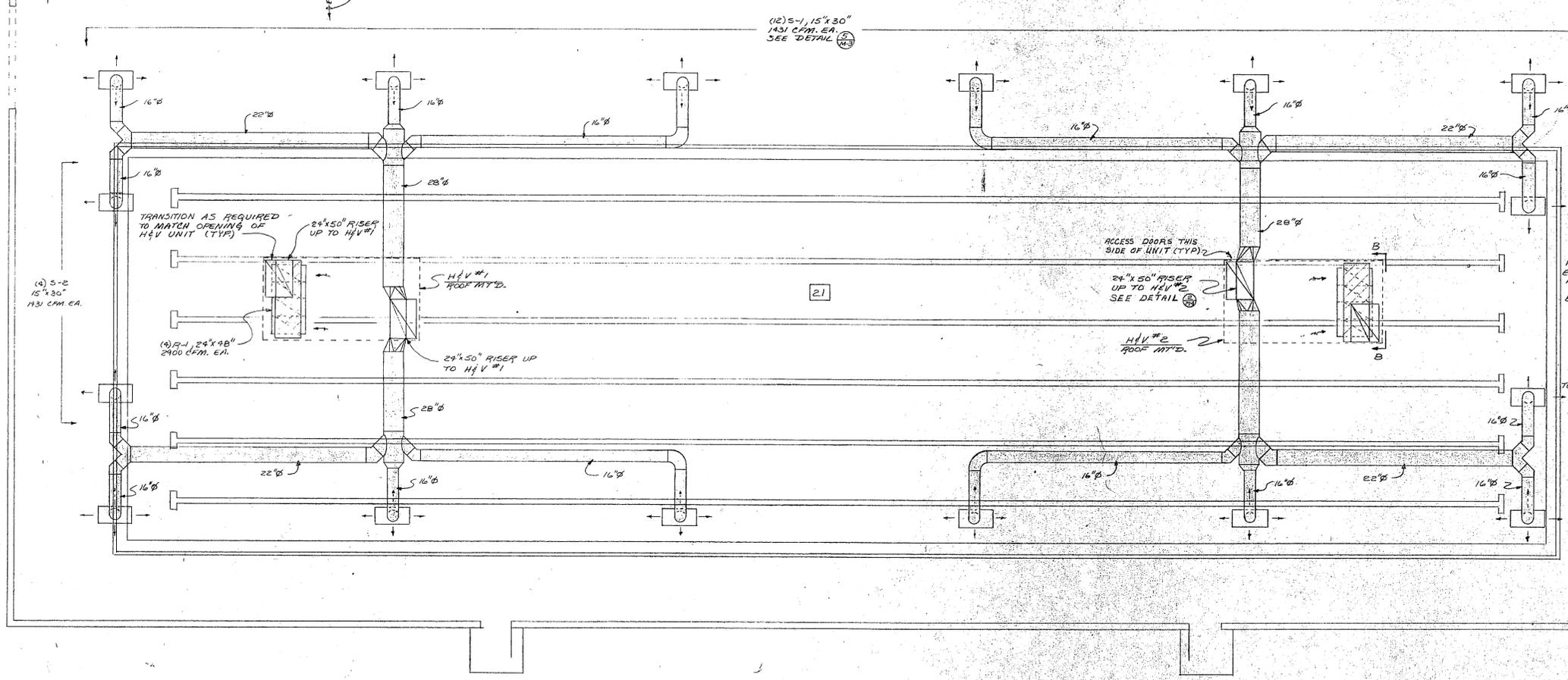
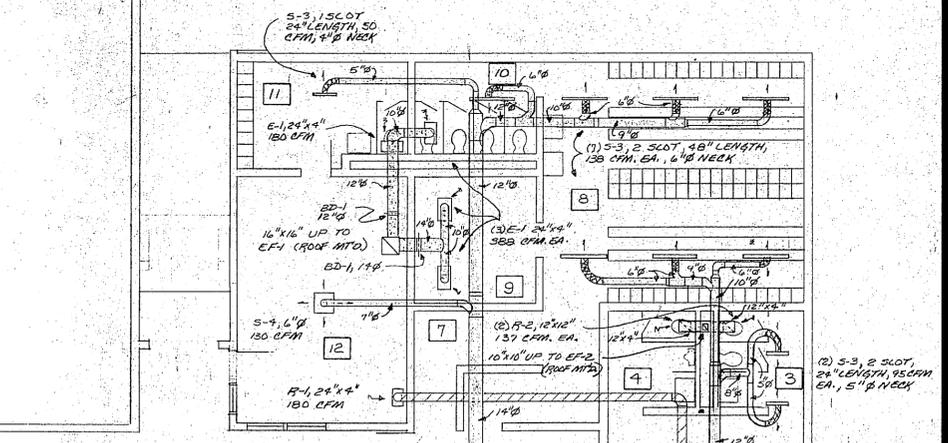
4 SECTION B-B  
SCALE: 1/4" = 1'-0"



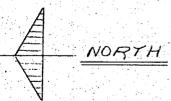
5 CEILING DIFFUSER DETAIL  
NO SCALE



6 COMB AIR INTAKE  
NO SCALE



1 FLOOR PLAN- HEATING & VENTILATING - BASE BID  
SCALE: 1/8" = 1'-0"



NOTE:  
DUCT WORK IN POOL AREA SHOWN  
HORIZONTAL FOR CLARITY PURPOSES  
ALL DUCT WORK IN TRUSS-JOISTS.

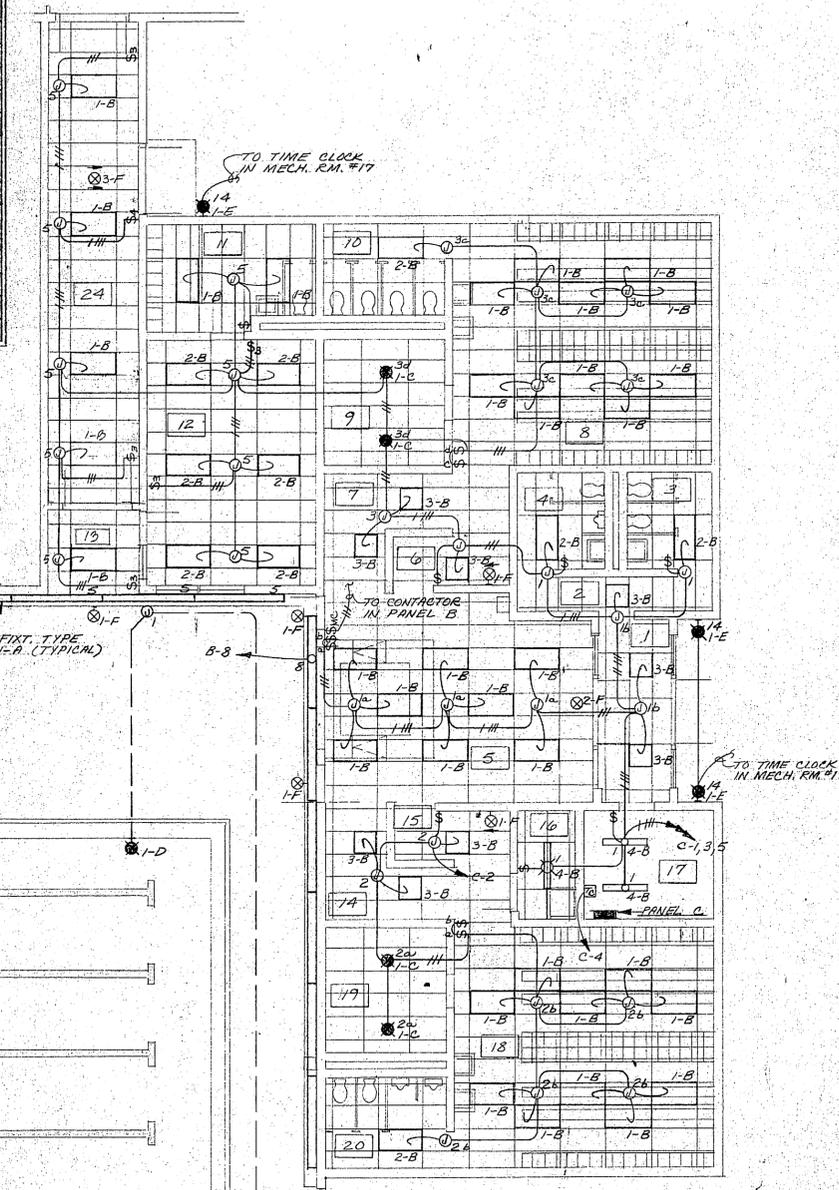
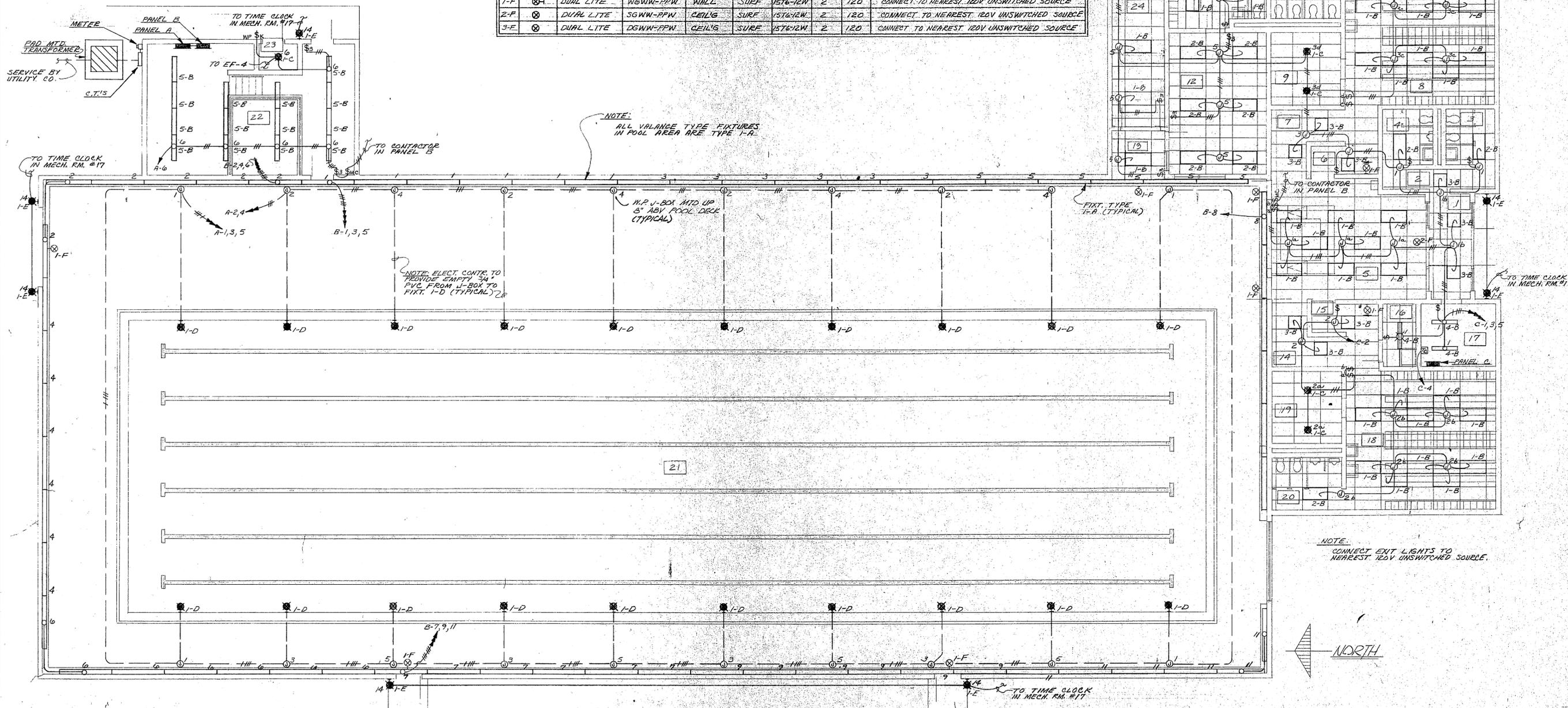


**ELECTRICAL LEGEND**

- PANEL
- HOME RUN TO PANEL NO. OF ARROWS INDICATES NO. OF CKTS.
- NO. OF HASH MARKS INDICATES NO. OF CONDUCTORS IN CONDUIT. NO HASH MARKS INDICATES TWO CONDUCTORS.
- CONDUIT CONCEALED IN CEILING OR WALL
- CONDUIT: EMPTY
- CONDUIT CONCEALED IN/OR UNDER FLOOR
- FLEX CONDUIT
- SPECIAL CABINETS
- LIGHT FIXTURE, FLUORESCENT
- LIGHT FIXTURE, INCANDESCENT, WALL MTD.
- LIGHT FIXTURE, INCANDESCENT
- EXIT LIGHT, WALL MTD.
- SWITCH
- SWITCH, 3-WAY
- WEATHERPROOF
- SUBSCRIPT INDICATES SWITCHING
- DUCT SMOKE DETECTOR
- SMOKE DETECTOR, REMOTE STATION
- SWITCH, 4-WAY
- SWITCH, KEY OPERATED
- MOTOR STARTER, SEE SCHEDULE
- OUTLET, DUPLEX
- OUTLET, WEATHERPROOF
- OUTLET, MOTOR
- OUTLET, THERMOSTAT
- OUTLET, SPECIAL PURPOSE
- OUTLET, SPEAKER
- JUNCTION BOX
- OUTLET, CLOCK, MT. AT 7'-0" UNLESS NOTED
- TIME CLOCK
- FIRE ALARM BREAK GLASS STATION
- FIRE ALARM BELL SINGLE PROJECTED
- OUTLET, TELEPHONE, PRIVATE
- SWITCH, MOMENTARY CONTACT
- OUTLET, TELEPHONE, PUBLIC
- PROGRAM BELL

**FIXTURE SCHEDULE**

LETTER	FIXTURE		LOCATION	TYPE	LAMP	FIXT. VOLT.	REMARKS
	SYMBOL	MFGR.					
1-A	—	FORUM BAG-7272	WALL	SURF	F40CW 150W	2	CONTINUOUS ROWS MITERED AT ENDS. MT. @ 9'-6"
1-B	—	WAKEFIELD TH2248-SS	CEILING	RECESS	F40CW	2	120
2-B	—	TH4248-SS		RECESS	F40CW	4	120
3-B	—	THU-2226-SS		RECESS	F40CW	2	120
4-B	—	PH-118T-SS		SURF	F40CW	2	120
5-B	—	ON-214		SURF	F40CW	2	120
1-C	—	DEVINE A18T7B-C43	CEILING	RECESS	100W	2	120
1-D	—	AQUATECH #2-III-N	PANEL WALL	RECESS	500W	1	120
1-E	—	PRESCOLITE WB-48	WALL	SURF	100W	1	120
1-F	—	DUAL LITE WGWW-PPW	WALL	SURF	1576-12W	2	120
2-F	—	DUAL LITE SGWW-PPW	CEILING	SURF	1576-12W	2	120
3-F	—	DUAL LITE DGWW-PPW	CEILING	SURF	1576-12W	2	120



1 FLOOR PLAN - LIGHTING CASE BID  
E1 SCALE: 1/8" = 1'-0"

**BERG-GRABOW & PARTNERS**  
 ARCHITECTS-ENGINEERS-PLANNING CONSULTANTS  
 bozeman montana

OWNER: CITY OF BOZEMAN, MONTANA  
 PROJECT: BOZEMAN MUNICIPAL POOL  
 SHEET: LIGHTING PLAN

ENGINEER: [Signature]  
 JOB NO. 7407  
 DEC. 1974  
**E-1**  
 OF 3



ENGINEER  
 BOZEMAN, MONTANA  
 BOZEMAN MUNICIPAL POOL  
 ELECTRICAL PLAN

OWNER  
 CITY OF BOZEMAN, MONTANA  
 PROJECT  
 BOZEMAN MUNICIPAL POOL  
 SHEET  
 ELECTRICAL PLAN

**BERG GRABOW & PARTNERS**  
 ARCHITECTS-ENGINEERS-PLANNING CONSULTANTS  
 bozeman montana

JOB NO. 7407  
 DEC. 1974  
 E-2  
 OF 3

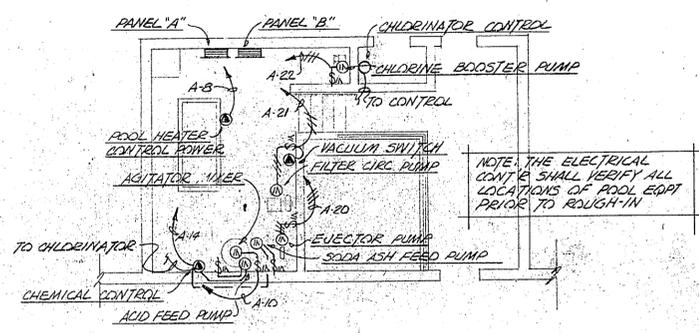
### PANEL & DISC. SCHEDULE

RM. NO.	CODE	TYPE	VOLTA GE	MINIS	BOX DEPTH	FEED	MOUNTING	REMARKS
	PANEL A	GEN LAB	120/208V, 3P, 4W	400	5 3/4"	BOTTOM	SURFACE	1 1/2" 300A MAIN BREAK
	PANEL B	GE. MAB	120/208V, 3P, 4W	100	5 3/4"	SIDE	SURFACE	1 1/2" 100MB5522A CONTACTOR
	PANEL C	GE. MAB	120/208V, 3P, 4W	100	5 3/4"	BOTTOM	SURFACE	
ROOF	DISC. #1	GE. TH13368RH	208V, 3P	60A		BOTTOM	SURFACE	@ UNIT, DISC. H&V UNIT #1
ROOF	DISC. #2	GE. TH13368RH	208V, 3P	60A		BOTTOM	SURFACE	@ UNIT, DISC. H&V UNIT #2

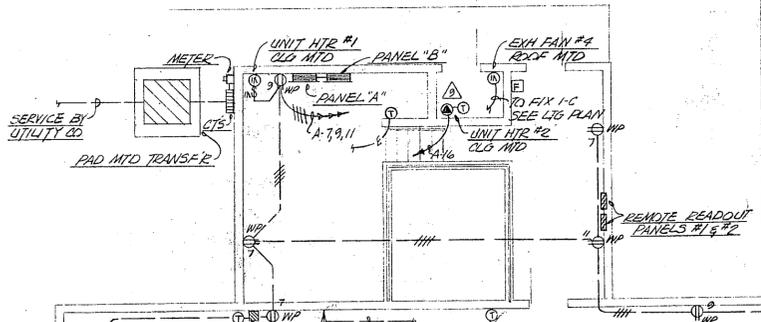
NOTE: DISCONNECTS #1 & #2 WILL NOT CHANGE UNDER ALTERNATE BID

### ELECTRIC HEATING SCHEDULE

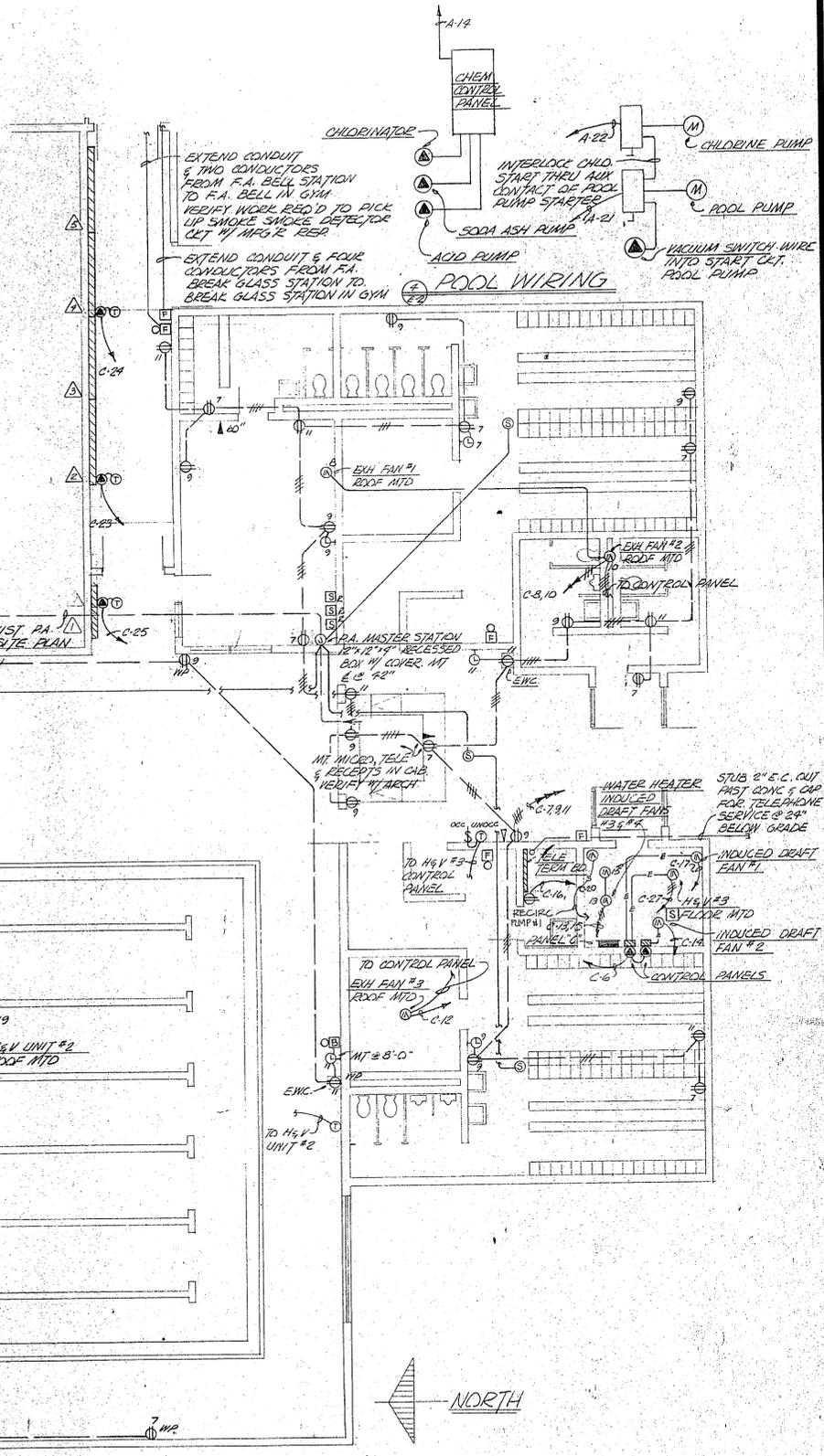
SYMBOL	MFG	CPT. NO.	TYPE	BTUH	WIRTS	VOLTS	CONTROL	REMARKS
△	CHROMALOX	SDS-5117	BASE BD.	3850	1125	208/1P	INTEGRAL T-STAT	
△		SDS-8187		6140	1800		INTEGRAL T-STAT	
△		SDS-818		6140			INTEGRAL T-STAT	
△		SDS-8187		6140			INTEGRAL T-STAT	
△		SDS-818	BASE BD.	6140				
△		SKR-9183	INFRA RED				WALL MTD STAT	1 1/2" GE 530B MAGNETIC CONTACTOR MTD. ABV CEILING
△		SKR-9183	INFRA RED				WALL MTD STAT	
△		SKR-9183	INFRA RED	1800			WALL MTD STAT	
△	CHROMALOX	CSF-2207	INDRZ UNIT HTR	6884	2000	208/1P	INTEGRAL T-STAT	



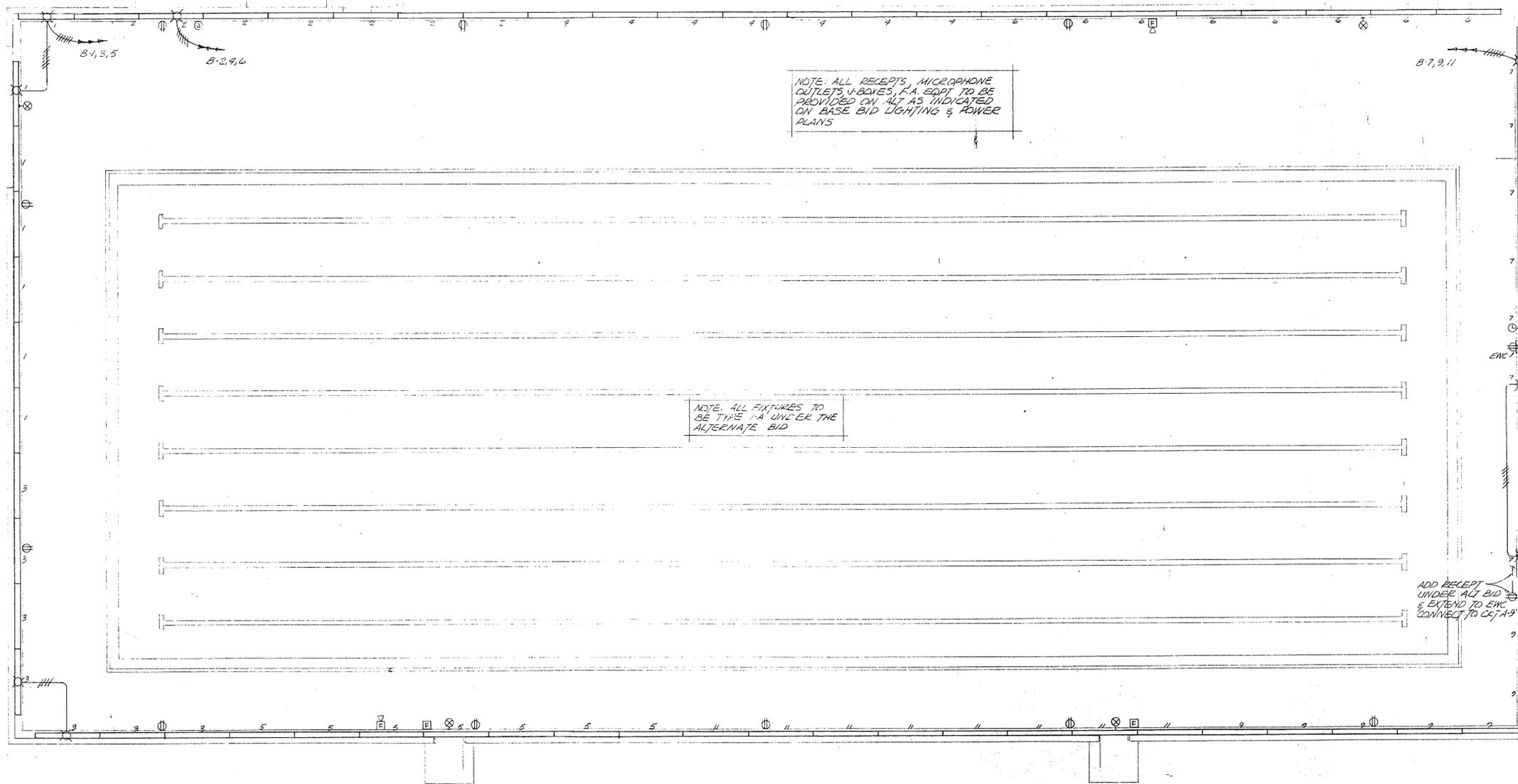
3 POOL EQPT POWER PLAN  
 SCALE: 1/8"=1'-0"



1 FLOOR PLAN - POWER CASE BID  
 SCALE: 1/8"=1'-0"



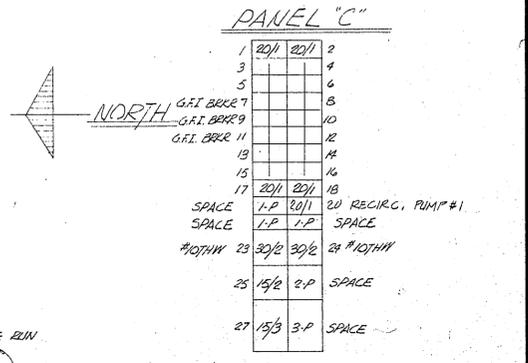
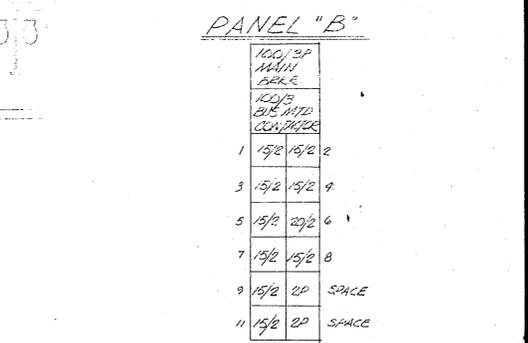
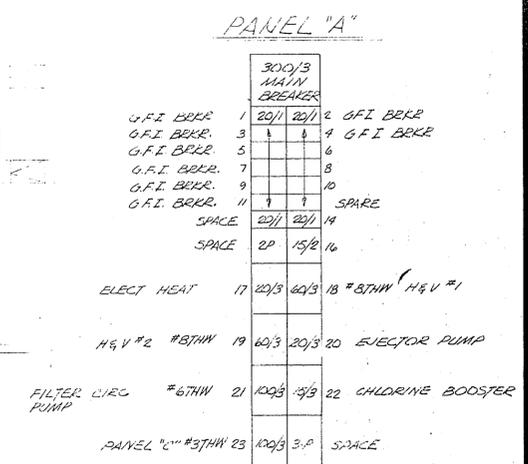
2 EXH FAN #1, #2 & #3 WIRING DIAGRAM  
 NOT TO SCALE



NOTE: ALL RECEPTS, MICROPHONE OUTLETS, BOXES, I.A. EQPT. TO BE PROVIDED ON ALT. AS INDICATED ON BASE BID LIGHTING & POWER PLANS

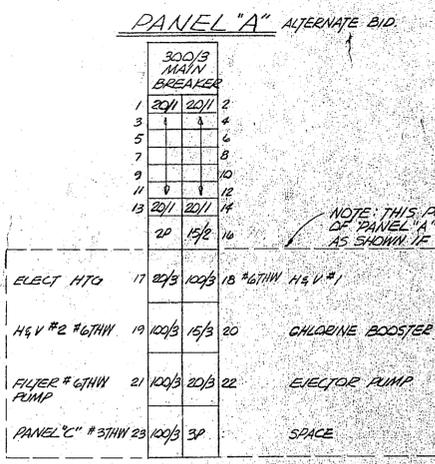
NOTE: ALL FIXTURES TO BE TYPE 1-A UNDER THE ALTERNATE BID

ADD RECEPT UNDER ALT BID & EXTEND TO ENC. CONNECT TO CRY-49

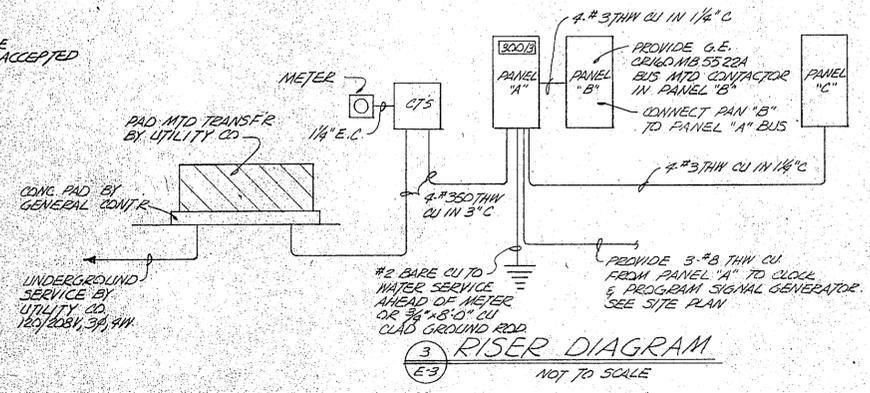
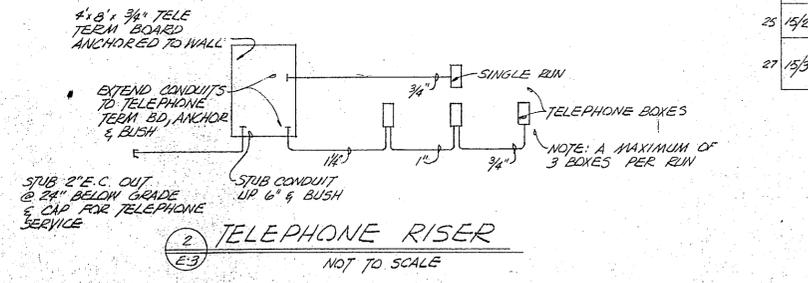


1 PARTIAL FLOOR PLAN - LIGHTING & POWER ALTERNATE BID SCALE: 1/8"=1'-0"

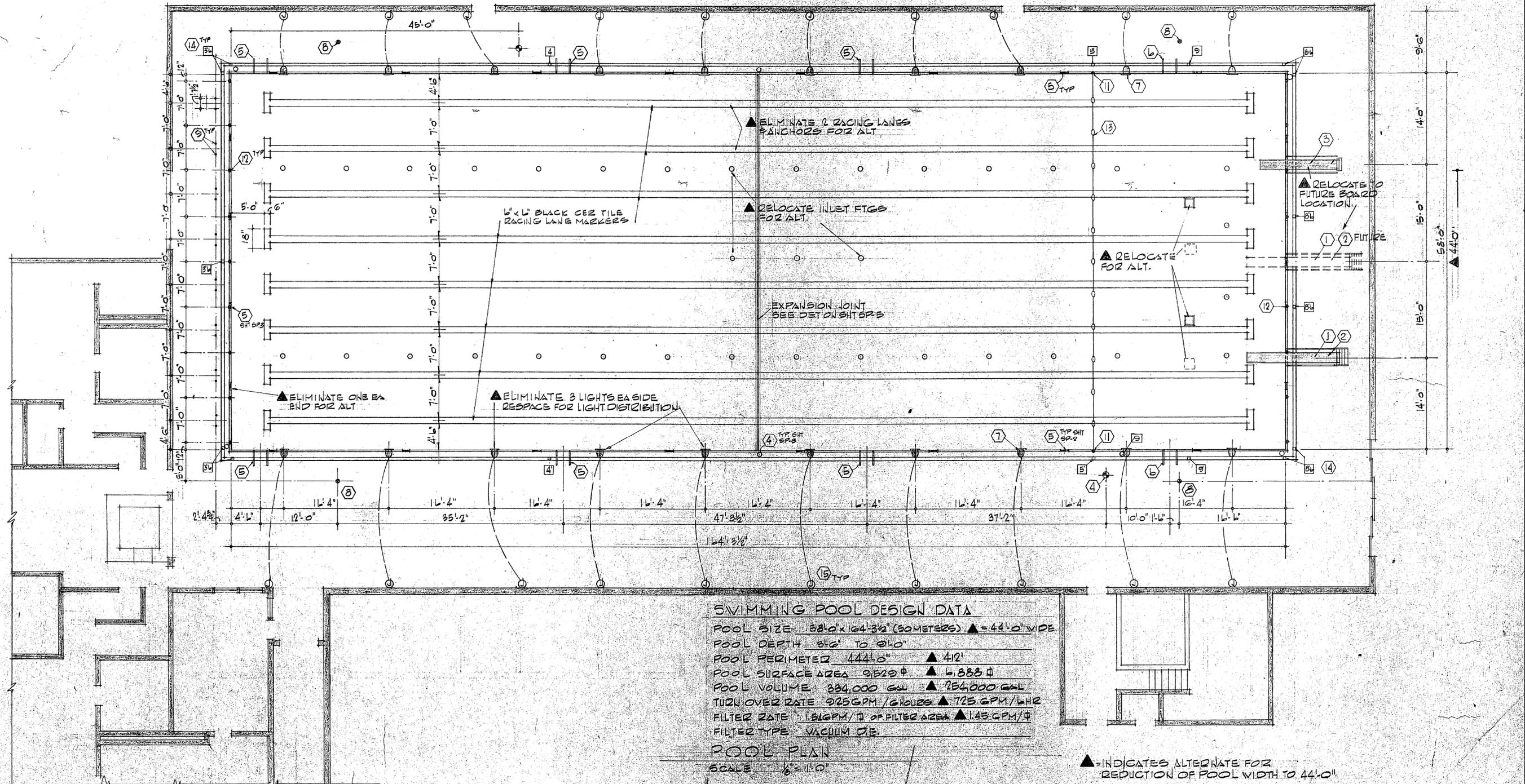
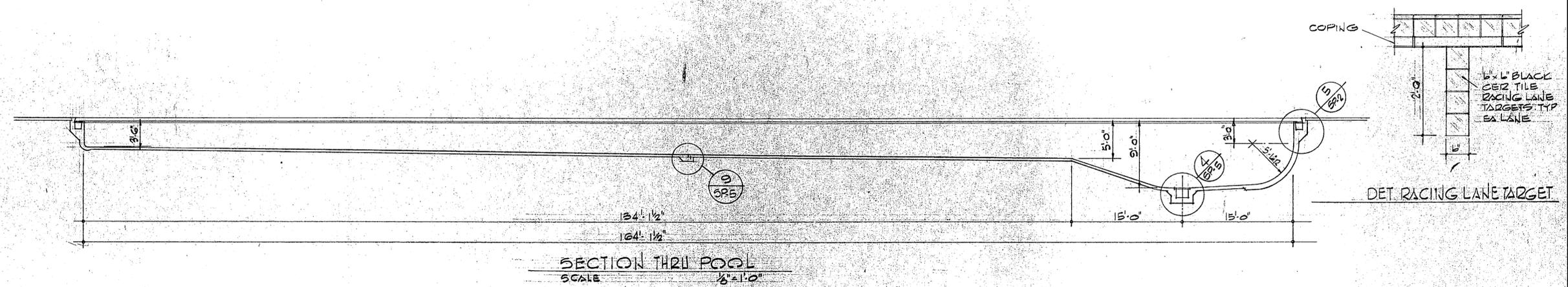
ROOM NO.	ITEMS FURNISHED BY MECH. CONTR.				ITEMS FURNISHED BY ELECTRICAL CONTRACTOR				AUXILIARY CONTROL EQUIPMENT FURNISHED BY MECH. CONTR. INSTALLED AND/OR CONNECTED BY ELECTRICAL CONTR.	REMARKS	
	UNIT	HP	Q	VIS.	MFR. NO.	SIZE	PL.	R.B. SEL. SW.			PILOT
ROOF	EF-1	1/4	1	120						TEMP. CONTROL	INTERLOCK 11 OIL-UMOC SW
ROOF	EF-2	1/4	1	120						TEMP. CONTROL	" " " " "
SHOWER	EF-3	1/4	1	120						TEMP. CONTROL	" " " " "
WDR. STOR.	EF-4	1/20	1	120							
MECH.	UNIT HTR.	1/45	1	120						TEMP. CONTROL	
MECH.	IND. D. FAN #1	1/4	1	120						TEMP. CONTROL	
MECH.	IND. D. FAN #2	1/20	1	120						TEMP. CONTROL	
MECH.	IND. D. FAN #3	1/4	1	120						TEMP. CONTROL	CONNECT TO HTR HTR CONTROL PANEL
MECH.	IND. D. FAN #4	1/4	1	120							" " " " "
MECH.	RECIRC. PUMP #1	1/2	1	120	GEORGINY					TOGGLE	
ROOF	H&V #1	10	3	208						TEMP. CONTROL	H&V #1 & H&V #2 ARE 15 HP, 3 @, 208V ON ALTERNATE
ROOF	H&V #2	10	3	208						TEMP. CONTROL	
MECH.	H&V #3	2	3	208						TEMP. CONTROL	
MECH.	FILTER CIRC. PUMP	15	3	208	GEORGINY	3		9	U.A.		START STOP PUSH BUTTON IN COVER, 20 HP ON ALT. - PROV. SAME STARTER
MECH.	EJECTOR PUMP	5	3	208	GEORGINY	0		3	U.A.		START STOP PUSH BUTTON IN COVER
MECH.	CHLOR. BOOSTER PUMP	1	3	208	GEORGINY	0		3			POOL EQPT CONTR.
MECH.	AGITATOR MTR	1/8	1	120	GEORGINY			1		TOGGLE	POOL EQPT CONTR.



NOTE: CRY NOS. TO CHANGE ACCORDINGLY ON EQPT AS INDICATED ON PAN "A" ALT BID



ENGINEER: [Signature]  
 OWNER: CITY OF BOZEMAN, MONTANA  
 PROJECT: BOZEMAN MUNICIPAL POOL  
 SHEET: LIGHTING & POWER PLAN  
**BERG-GRAW & PARTNERS**  
**ARCHITECTS-ENGINEERS-PLANNING CONSULTANTS**  
 bozeman montana  
 JOB NO. 7407  
 DEC. 1974  
**E-3**  
 OF 3



**SWIMMING POOL DESIGN DATA**

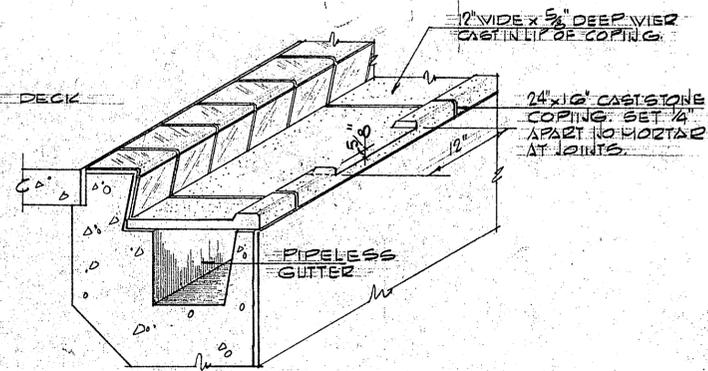
POOL SIZE	58'-0" x 164'-3 1/2" (50 METERS)	▲ = 44'-0" WIDE
POOL DEPTH	5'-0" TO 9'-0"	
POOL PERIMETER	444'-6"	▲ 412'
POOL SURFACE AREA	9529 #	▲ 6888 #
POOL VOLUME	334,000 GAL	▲ 254,000 GAL
TURN OVER RATE	925 GPM / 6 HOURS	▲ 725 GPM / 6 HR
FILTER RATE	1.84 GPM / # OF FILTER AREA	▲ 1.45 GPM / #
FILTER TYPE	VACUUM DE.	

**POOL PLAN**  
 SCALE 1/8" = 1'-0"

ENGINEER  
 SHEET NUMBER  
 DRAWING NUMBER  
 DETAIL KEY

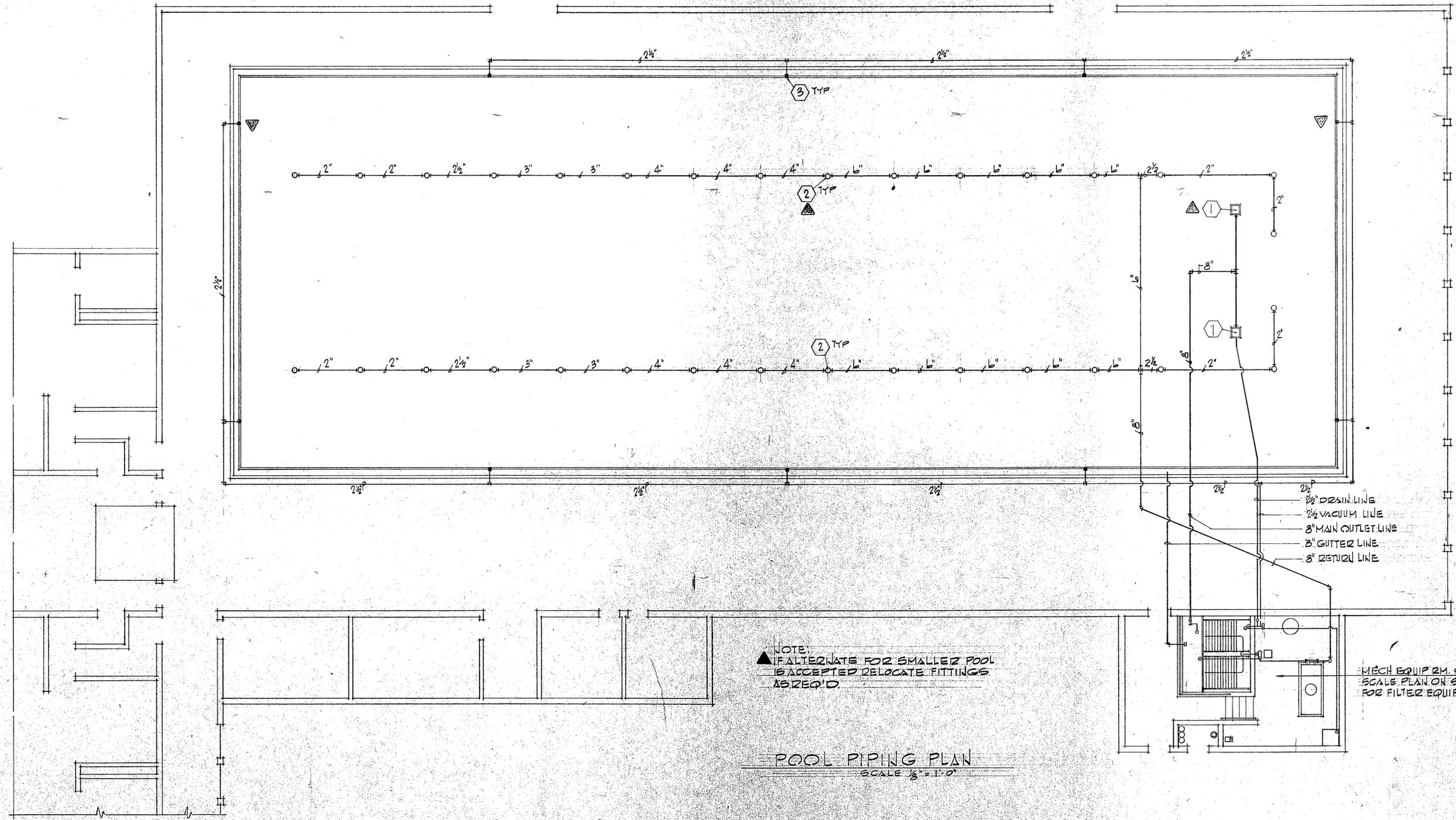
OWNER CITY OF BOZEMAN, MONTANA  
 PROJECT BOZEMAN MUNICIPAL POOL  
 SHEET SWIMMING POOL PLAN

**BERG-GRABOW & PARTNERS**  
 ARCHITECTS-ENGINEERS-PLANNING CONSULTANTS  
 bozeman montana



DET COPING SKIMMER WEIR ①

POOL FITTINGS					
MK.	DESCRIPTION	QUAN.	DET. NO.	MFR.	REMARKS
①	MAIN OUTLET GRATE & FRAME	2	④		FURNISHED & INSTALLED BY POOL CONTRACTOR
②	BOTTOM INLET FITTINGS	32	⑤		D.
③	VACUUM FITTINGS	10	⑥		D.
④	PIPELESS GUTTER CLEAN OUT COVERS - CAST IN COPING	7			D.
⑤	SKIMMER WEIRS BUILT IN LIP OF CASTSTONE COPING	21	①		D.
⑥	DECK DRAINS & PIPING				BY MECH CONTRACTOR SEE PLUMBING PLAN SHIT
⑦	EXPANSION JOINT				



POOL PIPING PLAN  
SCALE 3/8" = 1'-0"

NOTE: IF ALTERNATE FOR SMALLER POOL IS ACCEPTED RELOCATE FITTINGS AS REQ'D

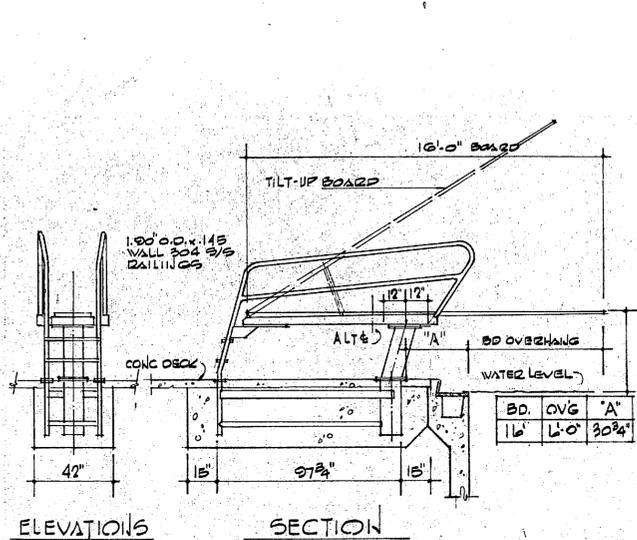
STATE OF MONTANA ARCHITECTS BOZEMAN LICENSED  
 O.Berg, Jr., 206 W.E. Grabow - 300 P.A. Scaphield - 199  
 BOZEMAN, MONTANA

ENGINEER  
 OWNER CITY OF BOZEMAN, MONTANA  
 PROJECT BOZEMAN MUNICIPAL POOL  
 SHEET SWIMMING POOL - PIPING PLAN

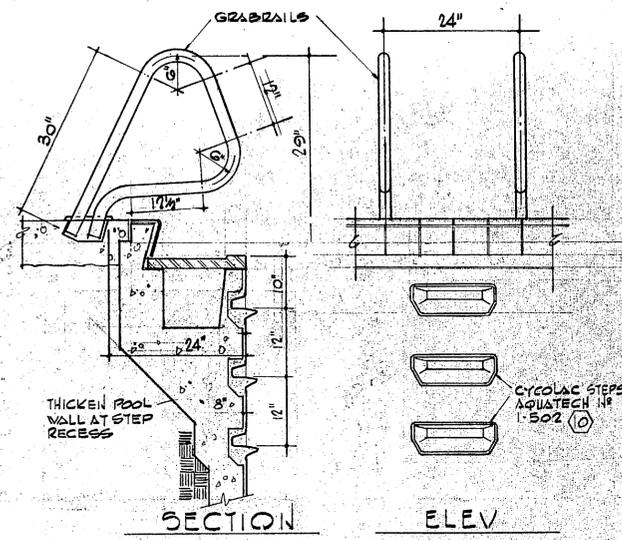
BERG - GRABOW & PARTNERS  
 ARCHITECTS-ENGINEERS-PLANNING CONSULTANTS  
 bozeman montana

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 of 5

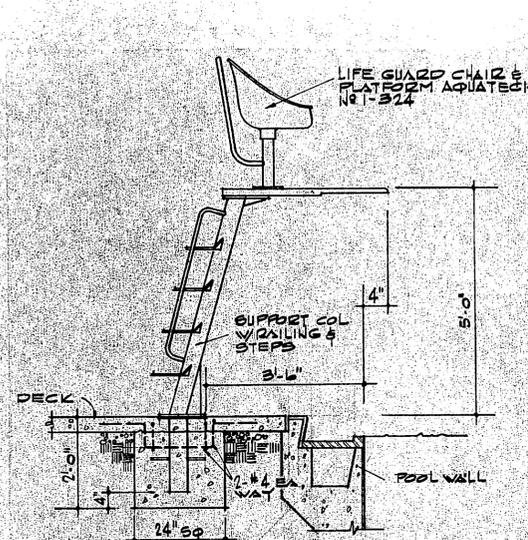
SHEET NUMBER  
 DETAIL NUMBER  
 DETAIL KEY



DET ONE METER DIVING TOWER (1) SR2



GRABRAIL DETAIL (2) SR2

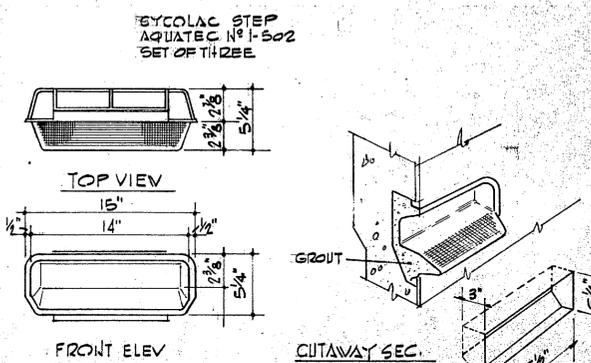


DET. LIFE GUARD CHAIR (3) SR2

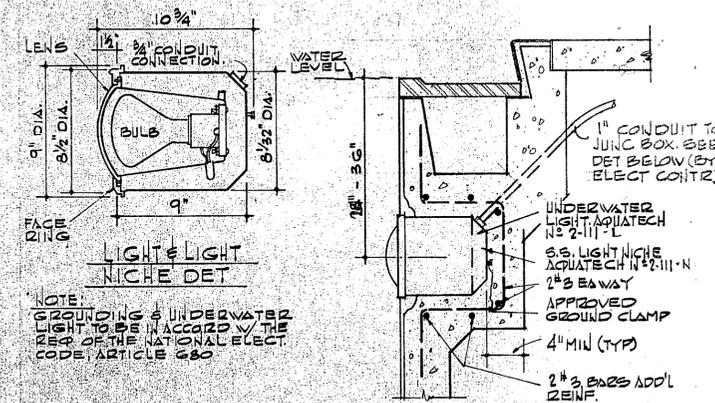
M.Q.	DESCRIPTION	QTY.	SET NO.	MF2	REMARKS
1	1/2 ALUMINUM DIVING BD.	1	(1) SR2	AQUATECH	FURNISHED & INSTALLED BY POOL CONTRACTOR.
2	ONE METER CANTILEVERED DIVING TOWER	1	(1) SR2	D.	D.
3	3/4 METER CANTILEVER TOWER W/ 1/2 ALUM. DIVING BOARD	1	(1) SR2	D.	D.
4	LIFE GUARD CHAIR W/ CANTILEVERED TOWER	2	(2) SR2	D.	D.
5	COMMERCIAL GRABRAILS W/ 3 RECESSED TREADS	6	(6) SR2	D.	D.
6	COMMERCIAL GRABRAILS W/ 4 RECESSED TREADS	2	(2) SR2	D.	D.
7	500 WATT UNDERWATER LIGHTS W/ LIGHT NICHE & CLEAR LENS	20	(20) SR2	D.	D.
8	CASTSTONE STATION ANCHORS	4	(4) SR2	D.	D.
9	STARTING PLATFORM DECK ANCHORS	16	(16) SR2	D.	D.
10	CYCOLAC STEPS	26	(26) SR2	D.	D.
11	LIFE LINE CUP ANCHORS	2	(2) SR2	D.	D.
12	RACING LANE MARKER CUP ANCHORS	18	(18) SR2	D.	D.
13	3/4" POLYETHYLENE LIFE LINE 38' L.F. W/ 11 1/2" x 9 1/2" x 3" FLOATS			D.	D.
14	CE2 TILE DEPTH MARKERS 4" HIGH BLACK 1/2" ON 6x6 TILES			D.	D.
15	POOL LIGHT JUNG BOXES	20	(20) SR2	D.	FURNISHED & INSTALLED BY ELECT CONTRACTOR.



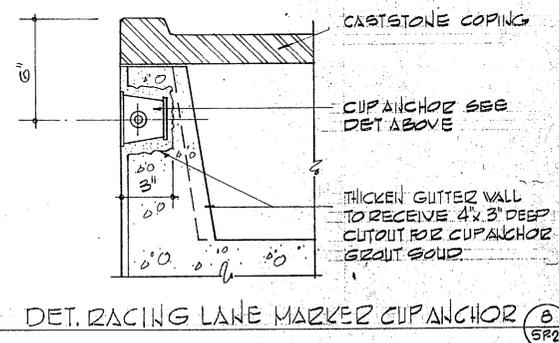
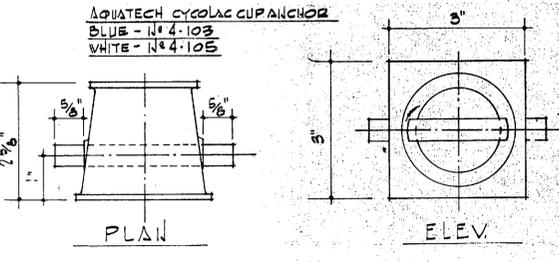
DETAIL DEPTH MARKERS (4) SR2



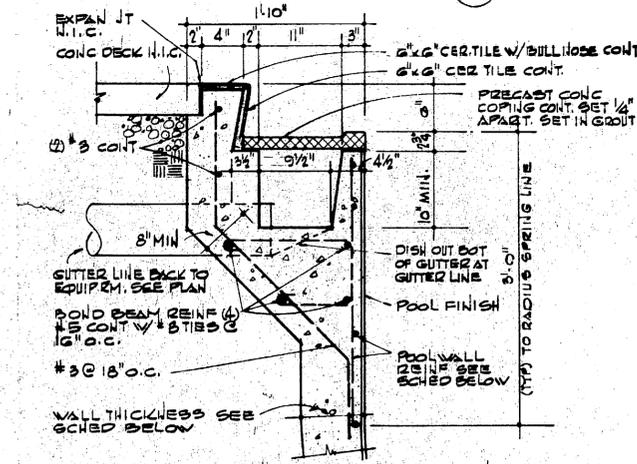
CYCOLAC STEP DETAIL (6) SR2



DET. UNDERWATER LIGHT (7) SR2

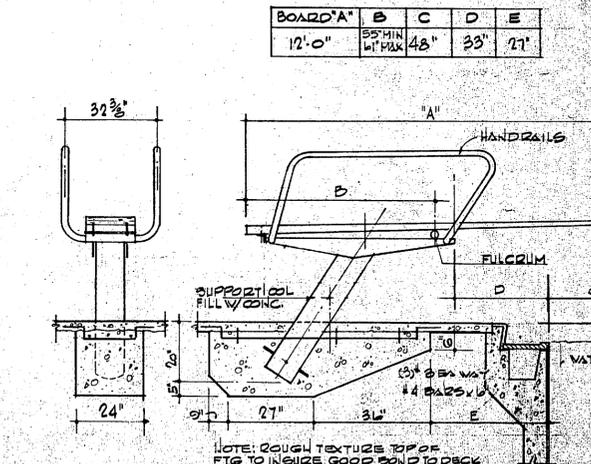


DET. RACING LANE MARKER CUP ANCHOR (8) SR2

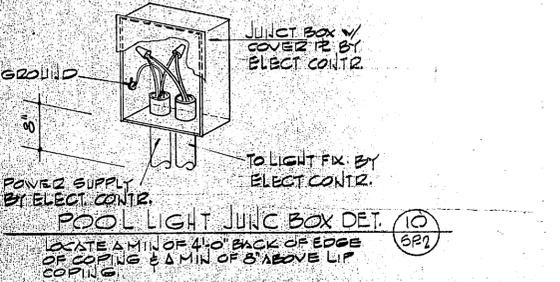


TYP SECTION THRU BOND BEAM & GUTTER (5) SR2

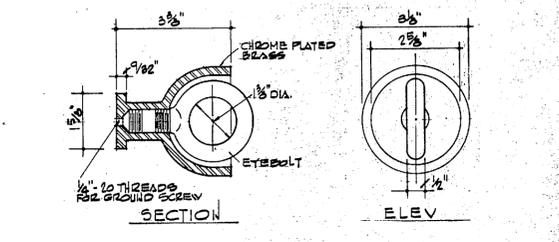
RADIUS	THICKNESS	FLOOR SLAB REINF.	VERT REINF. SIZE	HORIZ REINF. SPACING	HORIZ REINF. SPACE
6" TO 2'-0"	6"	3" SLAB W/ 1/2" OCEN	#3	12"	12"
2'-6" TO 4'-0"	7"	D.	#3	6"	12"
4'-0" TO 4'-9"	8" TO 8 1/2"	D.	#3	6"	12"
4'-9" TO 5'-6"	8 1/2" TO 8 3/4"	D.	#3	6"	12"
5'-6" TO 7'-0"	8 3/4"	D.	#3	6"	12"
7'-0" & OVER	9"	D.	#4	6"	12"



3/4 METER DIVING TOWER DET (9) SR2



POOL LIGHT JUNG BOX DET. (10) SR2



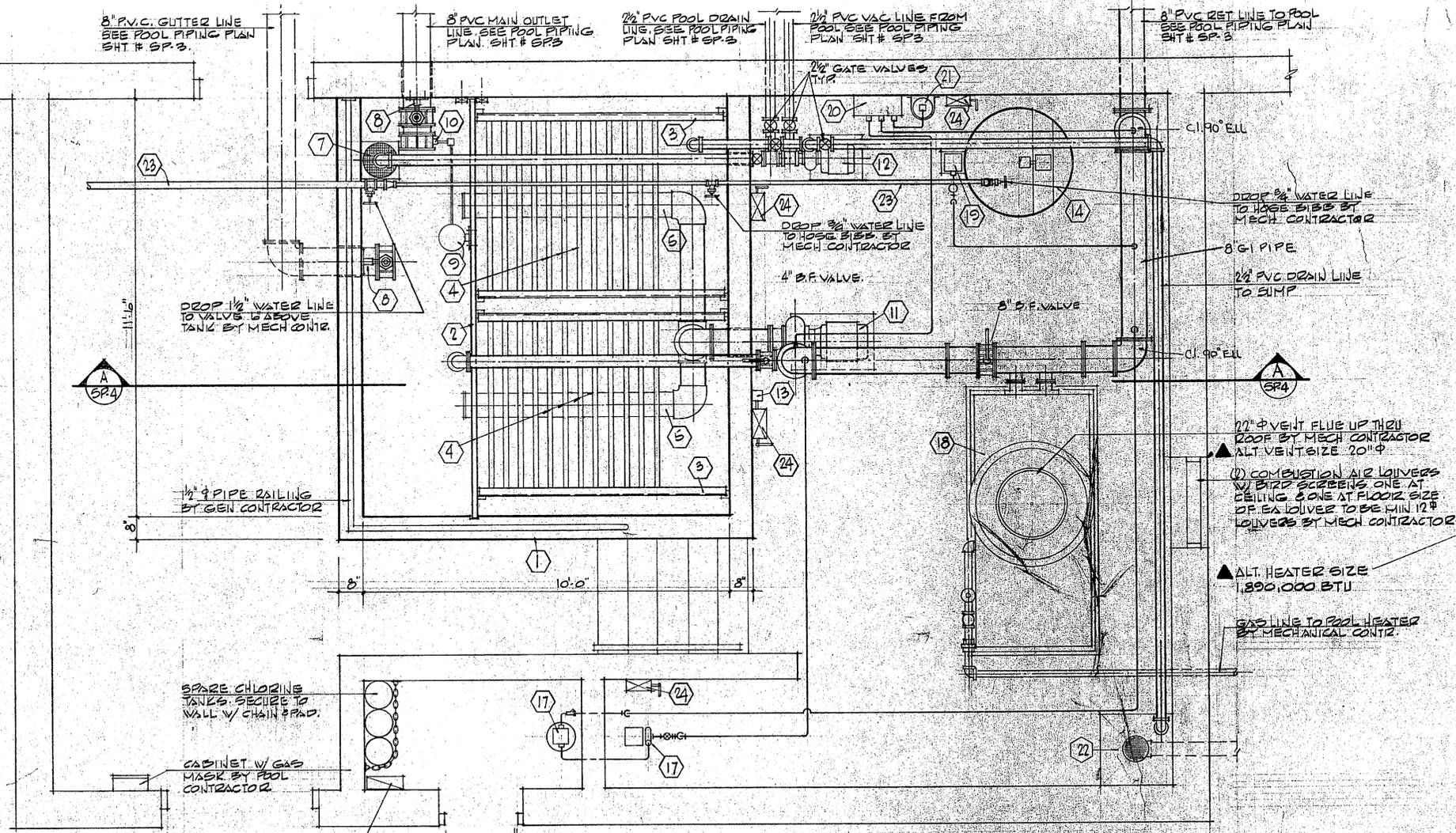
DET LIFE LINE CUP ANCHOR (11) SR2



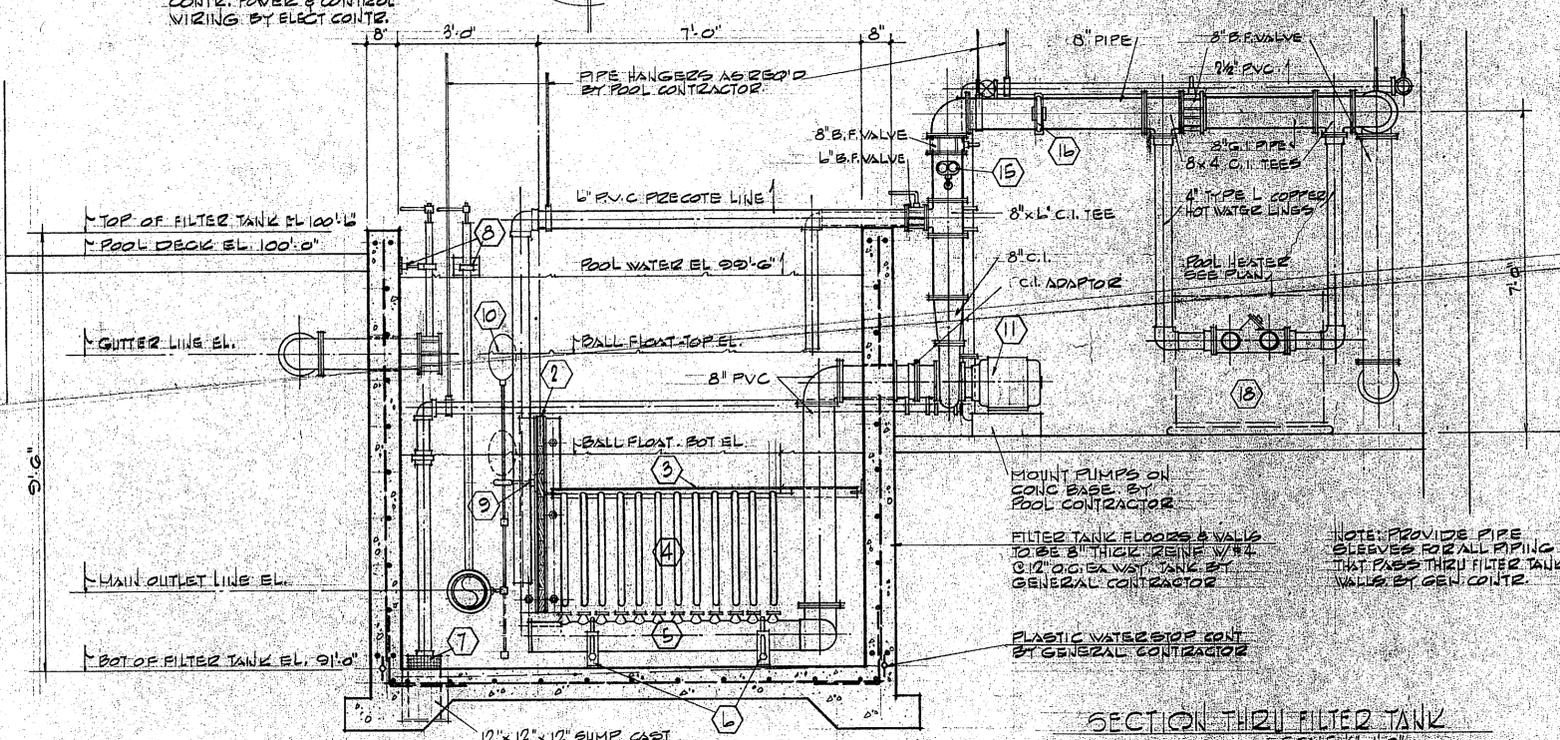
ENGINEER  
 O. Berg, Jr. - 206  
 W.E. Grabow - 300  
 P.A. Schaffner - 199  
 BOZEMAN, MONTANA  
 LICENSED ELECTRICAL ENGINEER

OWNER: CITY OF BOZEMAN, MONTANA  
 PROJECT: BOZEMAN MUNICIPAL POOL  
 SHEET: SWIMMING POOL - DETAILS

BERG-GRABOW & PARTNERS  
 ARCHITECTS-ENGINEERS-PLANNING CONSULTANTS  
 bozeman montana

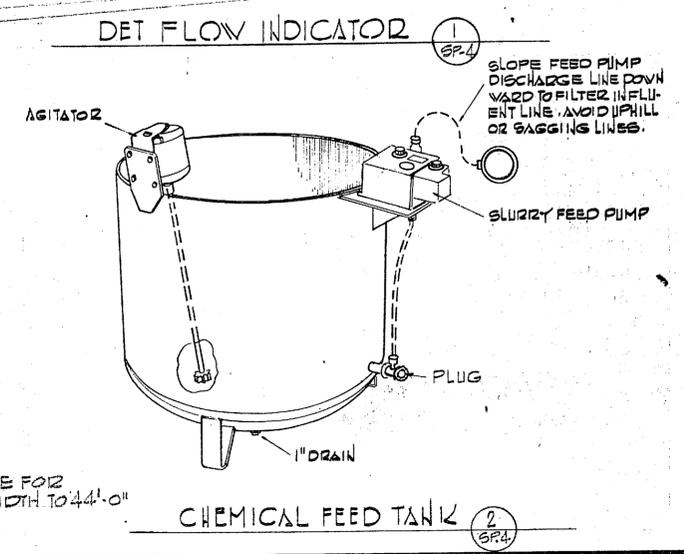
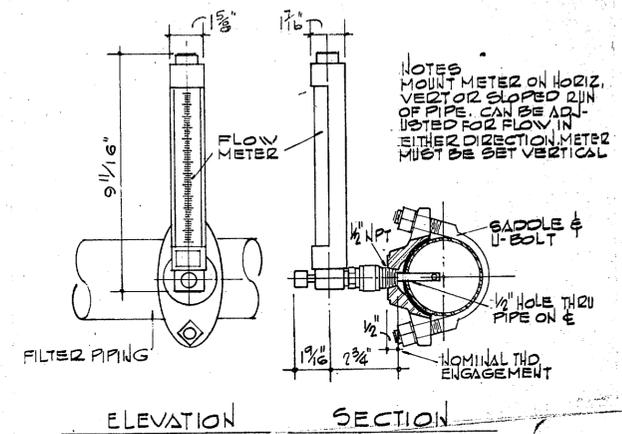


FILTERED EQUIPMENT ROOM PLAN  
SCALE 1/2" = 1'-0"



SECTION THRU FILTER TANK  
SCALE 1/2" = 1'-0"

FILTERED EQUIPMENT SCHED.					
NO.	DESCRIPTION	QUAN.	DET. NO.	MFR.	REMARKS
1	REINF CONC FILTER TANK SEE PLAN & SEC.	1	(2)		BY GENERAL CONTRACTOR
2	FILTER TANK BAFFLE & GUIDE CLEAR HEAT RESWOOD	1			BY GENERAL CONTRACTOR
3	FILTER ELEMENT HOLD DOWN BARS & ANCHOR CLIPS			AQUATECH	BY POOL CONTRACTOR
4	DIATOMACEOUS EARTH FILTER ELEMENTS - 30" x 120" ALT 20	24		D.	D.
5	MANIFOLD HEADER	2	(7)	D.	D.
6	MANIFOLD HEADER SUPPORT BRACKETS	4	(8)	D.	D.
7	TRASH GUARD FOR EJECTOR PUMP SUCTION LINE.	1	(9)	AQUATECH	D.
8	VALVE STEM MOUNTING BRACKETS	2	(3)	D.	D.
9	BALL FLOAT STEM GUIDE BRACKETS	1	(2)	D.	D.
10	BALL FLOAT LINKAGE, FLOAT STEM & VALVES. BALL FLOATS TO BE 3"	1		D.	D.
11	FILTER CIRC PUMP 20 HP ALT PUMP SIZE 15 HP	1		PACO	D.
12	EJECTOR PUMP 3 HP	1		MARLOW	D.
13	ADJUSTABLE MERCROID VACUUM SWITCH	1		MERCROID	D.
14	CHEM. FEEDER W/ 30" TANK VAGITATOR MIXER	1	(1)	AQUATECH	D.
15	VACUUM & PRESSURE GAUGE PANEL	1		AQUATECH	D.
16	FLOWMETER	1	(1)	FISCHER PORTER	D.
17	TANK MOUNTED CHLORINATOR 1 HP BOOSTER PUMP	1		FISCHER PORTER	D.
18	POOL HEATER - GAS FIRED A-F 2450 - 2,450,000 BTU	1		LAARS	GAS PIPING BY MECH CONTR. CONTROL WIRING BY ELECT CONTR.
19	SODA ASH FEED PUMP	1	(2)	PRECISION	BY POOL CONTRACTOR
20	CHEMICAL CONTROL SYSTEM	1		STRANTRON	D.
21	ACID FEED PUMP W/ ACID FEED TANK	1		PRECISION	D.
22	BACKWASH SUMP DRAIN & LINE TO WASTE SIZE FOR 200 GPM				SUMP BY GEN. CONTRACTOR DRAIN BY MECH CONTR.
23	FRESH WATER PIPING & VALVES TO FILTER TANK & CHEM TANK				BY MECH CONTRACTOR
24	MAG. STARTERS POWER & CONTROL WIRING FOR ALL MOTORS				BY ELECTRICAL CONTRACTOR



CHEMICAL FEED TANK  
SCALE 1/2" = 1'-0"

JOB NO. 7407  
 DEC. 1974  
 OF 5

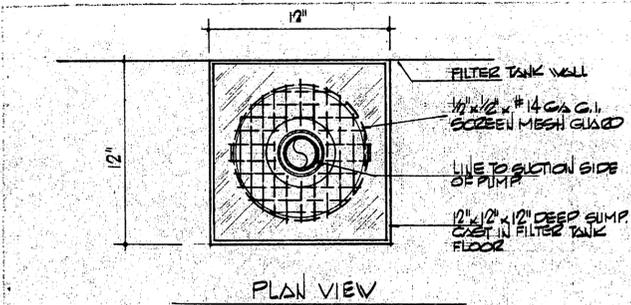
**BERG-GRABOW & PARTNERS**  
 ARCHITECTS-ENGINEERS-PLANNING CONSULTANTS  
 bozeman montana

OWNER: CITY OF BOZEMAN, MONTANA  
 PROJECT: BOZEMAN MUNICIPAL POOL  
 SHEET: SWIMMING POOL - EQUIPMENT

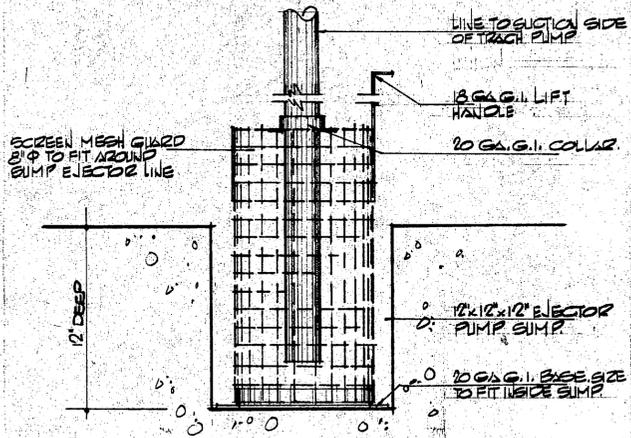
ENGINEER: [Signature]  
 STATE OF MONTANA REGISTERED PROFESSIONAL ENGINEER  
 License No. 199  
 BOZEMAN, MONTANA

DRAWING MAY BE REPRODUCED FOR PERSONAL USE ONLY. ALL MATERIALS AND METHODS OF INSTALLATION SHALL BE AS SHOWN UNLESS OTHERWISE SPECIFIED.  
 Drawn by: [Signature]  
 SHEET NUMBER: SP-4  
 DETAIL NUMBER: [Number]

▲ INDICATES ALTERNATE FOR REDUCTION OF POOL WIDTH TO 44'-0"

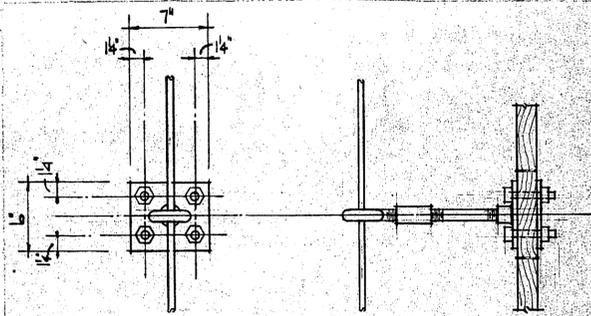


PLAN VIEW

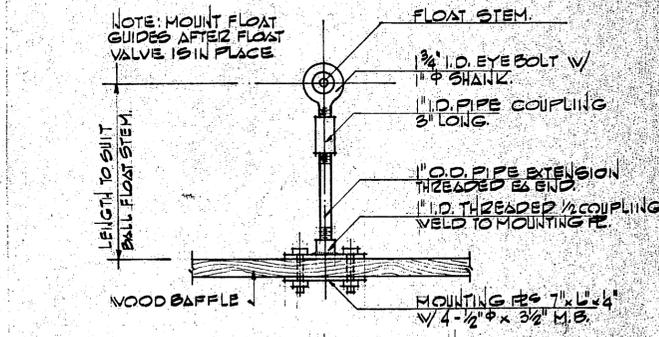


SECTION

1 DET. TRASH GUARD FOR EJECTOR SUMP

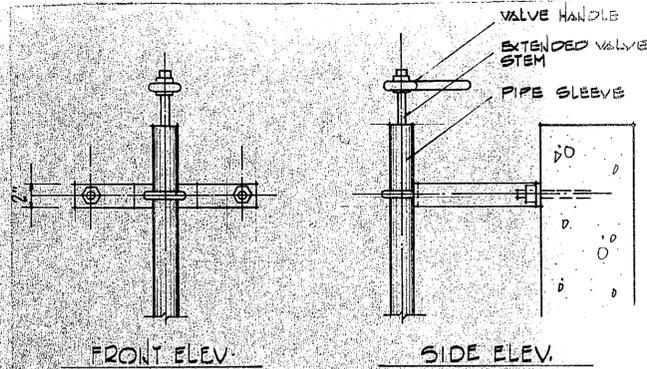


FRONT ELEV. SIDE ELEV.

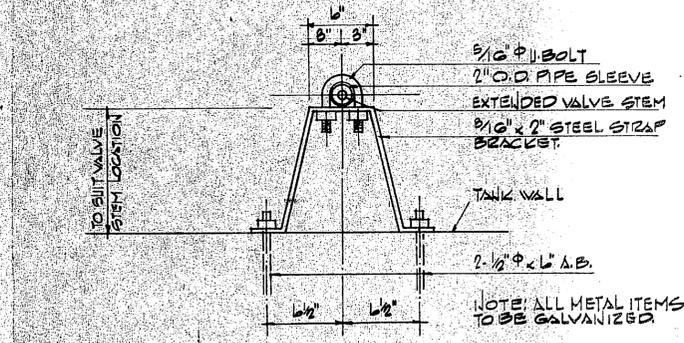


PLAN VIEW

2 BALL FLOAT STEM SUPPORT BRACKET

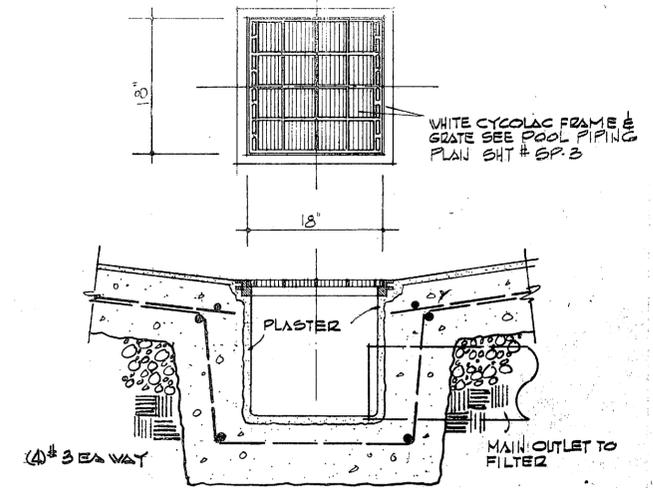


FRONT ELEV. SIDE ELEV.

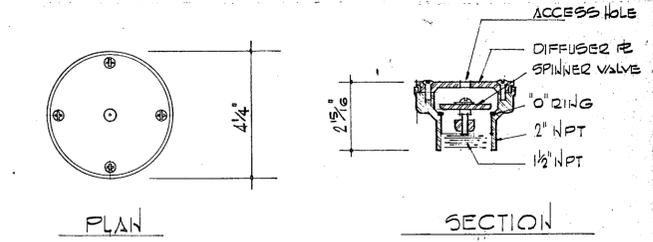


PLAN VIEW

3 VALVE STEM MOUNTING BRACKET DET

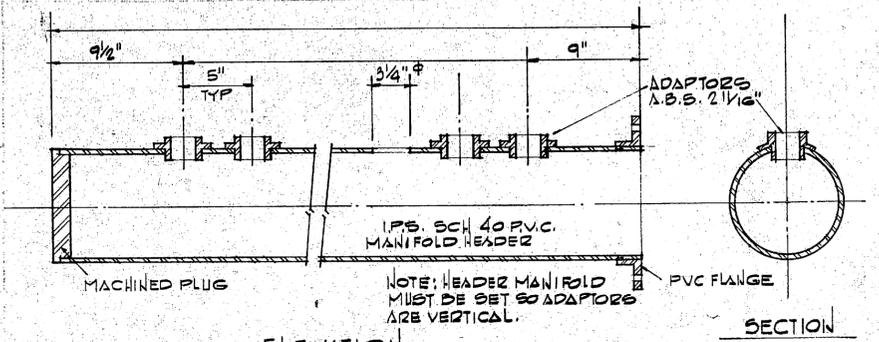


4 DET. SQUARE FRAME & GRATE



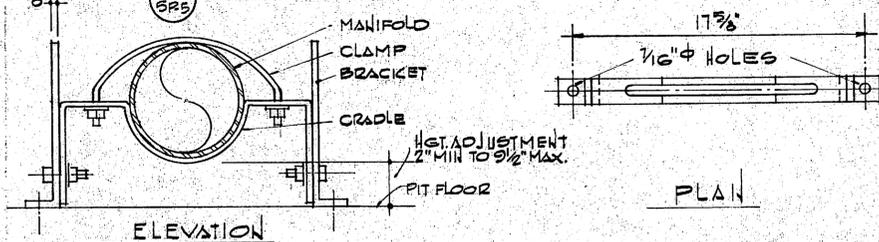
PLAN SECTION

5 DET FLOOR INLET FITTING



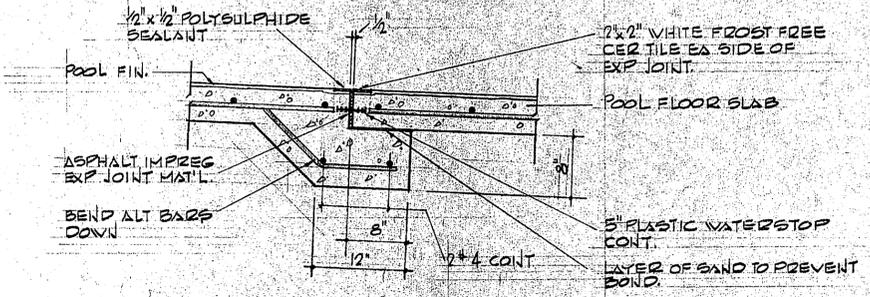
ELEVATION SECTION

7 MANIFOLD HEADER DET.

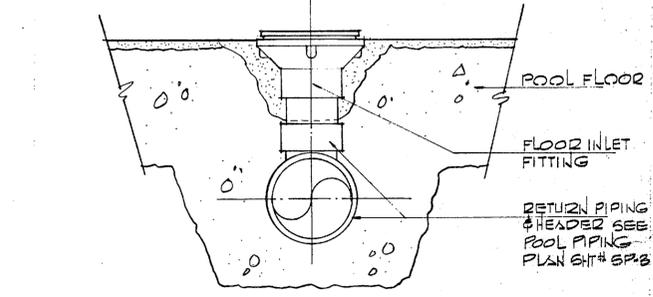


ELEVATION PLAN

8 MANIFOLD SUPPORT DET



9 EXPANSION JOINT DET



6 DET. VACUUM FITTING



ENGINEER  
 SHEET NUMBER  
 DETAIL NUMBER  
 SCALE 1/4" = 1'-0"

OWNER CITY OF BOZEMAN, MONTANA  
 PROJECT BOZEMAN MUNICIPAL POOL  
 SHEET SWIMMING POOL - DETAILS & SECTIONS

**BERG-GRABOW & PARTNERS**  
 ARCHITECTS-ENGINEERS-PLANNING CONSULTANTS  
 bozeman montana

JOB NO. 7407  
 DEC. 1974  
 SP-5  
 OF 5