CITY OF CHARLOTTESVILLE
PUBLIC WORKS
FACILITIES MAINTENANCE

DATE:	October 07, 2020
ADDENDUM NO.	2
NUMBER OF PAGES:	76
SOLICITIATION REFERENCE:	IFB#: COMMISSIONING SERICES SMITH AQUATIC CENTER INDOOR/21-19
TITLE:	Commissioning Services Smith Aquatic Center
BIDS/PROPOSALS DUE:	October 15, 2020 at 2:00 PM local prevailing time

This addendum has been issued to address the following:

1. **Bidder Question #1:** Is there a format or outline to follow for submittal of commissioning services proposal?

   Response #1: Please refer to the IFB for details regarding proposals. Attachments C, D, E, F, and G of the IFB are required with the submission of proposals. Additionally, per Note 17 in this addendum it is requested that bidders submit resumes with relevant project experience and certification(s) of individuals who will be performing commissioning services with their proposals.

2. **Bidder Question #2:** Is there a scoring matrix on commissioning proposals? If so, can we get scoring matrix?

   Response #2: No, per Page 5 Section I of IFB: *Awards shall be based on determination of the lowest responsive and responsible bidder.*

3. **Bidder Question #3:** M-12, Paragraph B: Request more detailed requirements of the commissioning authority's scope of equipment startup. This could range from administrative oversight, managing the startup schedule and verifying the contractors have complied with the startup requirements to witnessing on-site and being an active participant on every equipment and system startup. If the latter, recommend listing the equipment and systems for clarity.

   Response #3: Sheet M-12 Paragraph B details the role of the commissioning authority in relation to equipment start-up: *EQUIPMENT START-UP SUPERVISION: THE COMMISSIONING AUTHORITY SHALL MANAGE, SUPERVISE, AND COORDINATE START-UP OF THE EQUIPMENT. THE CONTRACTOR SHALL COORDINATE AND PARTICIPATE WITH THE COMMISSIONING AUTHORITY AND NOTIFY THE COMMISSIONING AUTHORITY AT LEAST 14 DAYS IN ADVANCE FOR ALL SYSTEM AND EQUIPMENT START-UPS, TRAINING, PRESSURE TESTS, OR SYSTEM FLUSH AND FILL.*

   The commissioning authority is responsible for all scope necessary to fulfill the requirements listed in the specifications. The equipment that is set to undergo start-up is listed on Sheet M-12 Paragraph B. All components and devices (sensors, valves, etc.) that make up these systems are included:

   POOL DEHUMIDIFICATION UNITS (PDU-)
   WATER SOURCE HEAT PUMP UNITS (WSHP-)
   CLOSED CIRCUIT COOLER (CT-)
   CONDENSER WATER PUMPS (CDP-)
   POOL WATER DISTRIBUTION PUMPS (PDP-)
   POOL WATER HEATER (B-)
   SHELL & TUBE HEAT EXCHANGER (HX-)
   EXHAUST FAN (IEF-)
   ENERGY RECOVERY UNIT (ERV-)
   BUILDING AUTOMATION SYSTEMS (BAS)

   Basis of designs for all equipment listed above can be found on Sheet M-1.

4. **Bidder Question #4:** May all the requested information be in one document or would you like the Price proposal to be separate?

   Response #4: Please refer to the IFB and Response #1 in this addendum. Per the IFB, it is requested that all documents related to the proposal be submitted in a single package/envelope. The Pricing Schedule (Attachment C of the IFB) shall also be included in the package/envelope.

5. **Bidder Question #5:** We are requesting electronic delivery of proposals be acceptable in lieu of hard copies. We are requesting this as a direct result of the COVID-19 environment we are all experiencing and would like to ensure the safety and health of all of the people that would need to be in contact with one another in order to be able to submit a hard copy.

   Response #5: Per Page 1 of the IFB, no telephoned, faxed, or emailed bids will be considered.

6. **Bidder Question #6:** If electronic delivery is not allowed…how many hardcopies of the proposal are required?

   Response #6: Only one hard copy of the proposal is required. Please refer to the IFB for instructions pertaining to the proposal.

7. **Bidder Question #7:** If electronic delivery is not allowed…may we not include the 3 lines of information required on the front of the shipping container? Our office is closed so we need to send this to FedEx for printing and shipping. There may not be an option for us to request this is printed on the shipping container or it might get overlooked if we do make the request.

   Response #7: Per Page 1 of the IFB, it is requested that the face of the envelope or shipping container be clearly marked in the lower left-hand corner as follows:

   IFB#: COMMISSIONING SERVICES SMITH AQUATIC CENTER/21-19
   TITLE: COMMISSIONING SERVICES SMITH AQUATIC CENTER
   OPEN: 2:00 PM ET, THURSDAY OCTOBER 15, 2020

   Please note, per Page 5 Section J of the IFB: *Bids will be date and time stamped upon receipt and retained unopened in a secure location until bid opening. No consideration will be given to date of postmark or error in delivery to incorrect address. It is the responsibility of the bidder to ensure timely and correct delivery of bid.*

8. **Bidder Question #8:** The drawing specifications provide the Commissioning requirements for the Contractor on M-12, Note 39. Are the required deliverables specified somewhere for the Owner's Independent Commissioning Agent other than directing the equipment testing and Smoke Test review, i.e. Cx Agent certification, Cx Plan, Cx Meeting Minutes, Submittal Reviews, Pre-Functional Construction Checklists, Functional Performance Tests, Commissioning Issues Log, O&M Manual Review, Training Agenda, Final Cx Report, etc? It may be difficult to evaluate/compare Bids and ensure City satisfaction if some requirements are not stipulated.

   Response #8: Please refer to Response #3 and Note #17 in this addendum; the activities listed (CxA certification, Cx Plan, Cx Meeting Minutes, Submittal Reviews, Pre-Functional Construction Checklists, Functional Performance Tests, Cx Issues Log, O&M Manual Review, Training Agenda, Final Cx Report, etc.) are all considered necessary deliverables in order to complete the commissioning scope of work as described in the specifications.

9. **Bidder Question #9:** Has the Contractor provided a CPM schedule that identifies the Project Start and Substantial Completion date?

   Response #9: Yes, per the Contractor's schedule, the project start date is 09/09/2020 and the substantial completion date is 04/01/2021.

10. **Bidder Question #10:** Is there a recent TAB report available for the building?

    Response #10: The most recent TAB report for the building was completed on 01/30/2012 after the building was constructed. It is attached at the end of is addendum for reference (Attachment A).

11. **Bidder Question #11:** Will the most current construction schedule be available prior to bid submission, so we can determine roughly how the equipment and systems may or may not be clustered for start-up and testing.

Response #11: Yes, the current construction schedule is attached at the end of this addendum for reference. (Attachment B).

12. **Bidder Question #12:** Is the swimming pool water chemistry and treatment methodology to remain unchanged? Is the water treatment chemistry available for the Cx team's review?

    Response #12: Yes, the swimming pool water chemistry and treatment methodology is to remain unchanged. The City of Charlottesville's Parks & Recreation Department manages pool treatment. Information pertaining to pool water chemistry and treatment may be acquired during the project if necessary.

13. **Bidder Question #13:** Are there any known building envelope deficiencies?

    Response #13: No, there are no known building envelope deficiencies.

14. **Bidder Question #14:** Are there any requirements for seasonal testing?

    Response #14: Yes, the commissioning authority will be required to be present during off-season testing and balancing per Sheet M-12 Section 39 Subsection F.

15. **Bidder Question #15:** Are there any requirements for a warranty review?

    Response #15: The commissioning authority is expected to review warranty(ies) during submittal reviews.

16. **Bidder Question #16:** Are there any requirements for electrical Cx?

    Response #16: Per the IFB and the drawings and specifications, the commissioning authority is responsible for the commissioning of any electrical components as they pertain to the equipment listed in the IFB and drawings and specifications.

17. The following requirements must be met by bidders: the commissioning authority must possess ASHRAE's BCxP, AEE's CBCP, or AABC's CxA. All personnel involved in the execution of the work shall be experienced in the commissioning of mechanical systems. The firm shall not be the installer of the systems to be commissioned and shall be otherwise independent of the project. Additionally, it is requested that bidders submit resumes with relevant project experience and certification(s) of individuals who will be performing commissioning services with their proposals.

Note: A signed acknowledgment of this addendum must be received at the location indicated on the solicitation either prior to the solicitation due date and hour or attached to your bid/proposal. Signature on this addendum does not substitute for your signature on the original bid/proposal document. The original bid/proposal document must be signed.

Respectfully,

Ryan Dewyea
Project Manager

_____
Name of Bidder/Offeror

_____
Signature & Title

_____
Date

ATTACHMENT A

MOORE'S
ELECTRICAL & MECHANICAL CONSTRUCTION, INC

P.O. Box 119 • 101 Edgewood Avenue • Altavista, VA 24517

X

Transmittal

February 1, 2012

TO: 2rW Consultants, Inc.
100 10th St NE, Suite 202
Charlottesville, VA 22902

ATTN: Peter Mackey

PROJECT NAME: Smith Aquatic Center

WE ARE SENDING YOU _X_ Attached __ Under separate cover via _____ the following items:

__ Shop drawings __ Prints __ Plans __ Samples __ Specifications

__ Copy of letter __ Change Orders X Other

COPIES	DATE	NO.	DESCRIPTION
1			Final TAB Report

THESE ARE TRANSMITTED as checked below:

__ For approval _ Approved as submitted __ Resubmit _____ copies for approval

_X_ For your use ___ Approved as noted __ Submit _____ copies for distribution

__ As requested __ Returned for corrections__ Return _____ corrected prints

__ For review and comment _____For Record Only

__ FOR BIDS DUE _____ __ PRINTS RETURNED AFTER LOAN TO US

REMARKS:

Andy Moore/jj

Andy Moore
VP - Mechanical

2rW RECEIVED
FEB 02 2012
PROJECT NO: 08118

TEST, ADJUST AND BALANCE REPORT

DATE: JANUARY 30, 2012

PROJECT: SMITH AQUATIC CENTER
CHARLOTTESVILLE, VIRGINIA

HVAC CONTRACTOR: MOORE'S ELECTRICAL & MECHANICAL
1125 STONEY RIDGE ROAD
CHARLOTTESVILLE, VIRGINIA
JEAN CAMPBELL
PHONE (434) 293-8669 FAX (434) 293-8942

NEBB TAB FIRM: MID ATLANTIC TEST & BALANCE, INC.
1120 WILBORN AVENUE
SOUTH BOSTON, VIRGINIA 24592
DAVID FORLINES
PHONE (434) 572-4025 FAX (434) 572-4215

CERTIFICATION

Certification No. 3062

PROJECT: SMITH AQUATIC CENTER

ADDRESS: CHARLOTTESVILLE, VIRGINIA

THE DATA PRESENTED IN THIS REPORT IS AN EXACT RECORD OF SYSTEM PERFORMANCE AND WAS OBTAINED IN ACCORDANCE WITH NEBB STANDARD PROCEDURES. ANY VARIANCES FROM DESIGN QUANTITIES WHICH EXCEED NEBB TOLERANCES ARE NOTED THROUGHOUT THIS REPORT.

THE AIR DISTRIBUTION SYSTEMS HAVE BEEN TESTED & BALANCED AND FINAL ADJUSTMENTS HAVE BEEN MADE IN ACCORDANCE WITH NEBB *"PROCEDURAL STANDARDS FOR TESTING, ADJUSTING, BALANCING OF ENVIRONMENTAL SYSTEMS"* AND THE PROJECT SPECIFICATIONS.

NEBB TAB FIRM: MID ATLANTIC TEST AND BALANCE, INC.

REG. NO. 3062 **CERTIFIED BY: DAVID FORLINES** **DATE: JANUARY 30, 2012**

THE HYDRONIC DISTRIBUTION SYSTEMS HAVE BEEN TESTED & BALANCED AND FINAL ADJUSTMENTS HAVE BEEN MADE IN ACCORDANCE WITH NEBB *"PROCEDURAL STANDARDS FOR TESTING, ADJUSTING, BALANCING OF ENVIRONMENTAL SYSTEMS"* AND THE PROJECT SPECIFICATIONS.

NEBB TAB FIRM: MID ATLANTIC TEST AND BALANCE

REG. NO. 3062 **CERTIFIED BY: DAVID FORLINES** **DATE: JANUARY 30, 2012**

SUBMITTED AND CERTIFIED BY: DAVID FORLINES

NEBB TAB FIRM: MID ATLANTIC TEST AND BALANCE, INC.

NEBB TAB SUPERVISOR: DAVID FORLINES

REG. NO. 3062 **SIGNATURE:**

DATE: JANUARY 30, 2012 CERTIFICATION EXPIRATION DATE: 3/31/2012

Mid-Atlantic Test and Balance, Inc.
DAVID FORLINES
CERTIFICATION
3062
Exp. 3/31/12
Air and Hydronic Systems

NATIONAL ENVIRONMENTAL BALANCING BUREAU

MID ATLANTIC TEST & BALANCE, INC.

1120 WILBORN AVENUE
SOUTH BOSTON, VA 24592
TEL. (434) 572-4025 FAX (434) 572-4215

STATEMENT OF SYSTEM CONFORMANCE

PROJECT: SMITH AQUATIC CENTER

ALL INFORMATION CONTAINED IN THIS REPORT HAS BEEN ACCUMULATED FROM THE SYSTEMS AND EQUIPMENT INSTALLED AT THE ABOVE REFERENCED PROJECT. ALL MEASUREMENTS CONTAINED IN THIS REPORT ARE TRUE AND CORRECT AS OF THE DATE OF THE TEST. ALL TESTS PERFORMED ON THIS PROJECT MEET OR EXCEED THE STANDARDS SET FORTH BY THE NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB) NATIONAL STANDARDS, SIXTH EDITION, 1998.

THE SYSTEMS AT THE ABOVE REFERENCED PROJECT APPEAR TO BE INSTALLED AND OPERATING IN ACCORDANCE WITH THE INTENT OF THE PLANS AND SPECIFICATIONS. ANY DEVIATION FROM THE DESIGN CRITERIA IS NOTED IN THE REMARKS SECTION AT THE BOTTOM OF EACH REPORT.

AIR APPARATUS TEST REPORT

PROJECT: SMITH AQUATIC CENTER

SYSTEM/UNIT: PDU-1

LOCATION:

UNIT DATA	
MAKE	MUNTERS
MODEL	PV-W1S-PA1V
SERIAL	58345
ARR./ CLASS	DWDI / I
DISCHARGE	VERTICAL
MAKE SHEAVE	BROWNING
SHEAVE DIA./BORE	6.6 X 1 5/8
NO. BELTS/SIZE	2 / 5VX860
NO. FILTERS/TYPE/SIZE	15 / PLEATED / 16X20X2

MOTOR DATA	
MAKE	WEG
FRAME	256T
H.P. / RPM	20 / 1775
VOLTS / PHASE / HZ.	208 / 3 / 60
F.L. AMPS / S.F.	55.3 / 1.15
MAKE SHEAVE	BROWNING
SHEAVE DIA./BORE	3.0 X 2"
SHEAVE C.L. DISTANCE	27"
SHEAVE OPER. DIA.	FIXED

TEST DATA	DESIGN	ACTUAL
TOTAL CFM	15100	16575
TOTAL S.P. (IN.)	X	3.61
FAN RPM	X	915
MOTOR VOLTS T1-T2 T2-T3 T3-T1	208	202/203/202
MOTOR AMPS T1 T2 T3	55.3	50/50/49
OUTSIDE AIR CFM	3025	3040
RETURN AIR CFM	12075	13535

TEST DATA	DESIGN	ACTUAL
DISCHARGE S.P. (IN.)	X	0.078
SUCTION S.P. (IN.) (-)	X	3.532
REHEAT COIL △S.P. (IN.)	X	1.002
COOLING COIL △S.P. (IN.)	X	1.234
PREHEAT COIL △S.P (IN.)	X	0.242
FILTERS △S.P. (IN.)	X	0.4181
PREFILTER △ S.P. (IN.)	X	X
FINAL FILTER △ S.P. (IN.)	X	X
VORTEX DAMPER POSITION	X	X
OUT. AIR DAMP. POSITION	X	X
RET. AIR DAMP. POSITION	X	X

REMARKS:

TEST DATES: 8/26/10 - 10/20/10

READINGS BY: C. ST. JOHN, C. ESTILL, J. POOL, M. BRIZENDINE, R. SEAMONS

AIR APPARATUS TEST REPORT

PROJECT: SMITH AQUATIC CENTER

SYSTEM/UNIT: PDU-2

LOCATION:

UNIT DATA	
MAKE	MUNTERS
MODEL	PV-W1S-PMV
SERIAL	58345
ARR./ CLASS	DWDI / I
DISCHARGE	VERTICAL
MAKE SHEAVE	BROWNING
SHEAVE DIA./BORE	6.6 X 1 5/8
NO. BELTS/SIZE	2 / 5VX860
NO. FILTERS/TYPE/SIZE	15 / PLEATED / 16" X 20" X 2"

MOTOR DATA	
MAKE	WEG
FRAME	256T
H.P. / RPM	20 / 1775
VOLTS / PHASE / HZ.	208 / 3 / 60
F.L. AMPS / S.F.	55.3 / 1.15
MAKE SHEAVE	BROWNING
SHEAVE DIA./BORE	13.0 X 2
SHEAVE C.L. DISTANCE	27"
SHEAVE OPER. DIA.	FIXED

TEST DATA	DESIGN	ACTUAL
TOTAL CFM	15100	16275
TOTAL S.P. (IN.)	X	3.953
FAN RPM	X	897
MOTOR VOLTS T1-T2 T2-T3 T3-T1	208	203/202/203
MOTOR AMPS T1 T2 T3	55.3	50/50/51
OUTSIDE AIR CFM	3025	3116
RETURN AIR CFM	12075	13159

TEST DATA	DESIGN	ACTUAL
DISCHARGE S.P. (IN.)	X	0.2282
SUCTION S.P. (IN.) (-)	X	3.725
REHEAT COIL △S.P. (IN.)	X	1.068
COOLING COIL △S.P. (IN.)	X	1.303
PREHEAT COIL △S.P. (IN.)	X	0.3932
FILTERS △S.P. (IN.)	X	0.4603
PREFILTER △S.P. (IN.)	X	X
FINAL FILTER △S.P. (IN.)	X	X
VORTEX DAMPER POSITION	X	X
OUT. AIR DAMP. POSITION	X	X
RET. AIR DAMP. POSITION	X	X

REMARKS:

AIR APPARATUS TEST REPORT

PROJECT: SMITH AQUATIC CENTER

SYSTEM/UNIT: GSHP-1A

LOCATION:

UNIT DATA	
MAKE	WATER FURNACE ENV.
MODEL	NDV049BR302NB
SERIAL	10030812
ARR./ CLASS	DWDI / I
DISCHARGE	VERTICAL
MAKE SHEAVE	DIRECT DRIVE
SHEAVE DIA./BORE	X
NO. BELTS/SIZE	X
NO. FILTERS/TYPE/SIZE	1 / PLEATED / 30X36X2

MOTOR DATA	
MAKE	GE
FRAME	56
H.P. / RPM	1 / 1050
VOLTS / PHASE / HZ.	208 / 1 / 60
F.L. AMPS / S.F.	7 / NG
MAKE SHEAVE	DIRECT DRIVE
SHEAVE DIA./BORE	X
SHEAVE C.L. DISTANCE	X
SHEAVE OPER. DIA.	X

TEST DATA	DESIGN	ACTUAL
TOTAL CFM	1360	1563
TOTAL S.P. (IN.)	X	0.3563
FAN RPM	DD	MED.
MOTOR VOLTS T1-T2 T2-T3 T3-T1	208	209
MOTOR AMPS T1 T2 T3	7	4.3
OUTSIDE AIR CFM	440	400
RETURN AIR CFM	920	1163

TEST DATA	DESIGN	ACTUAL
DISCHARGE S.P. (IN.)	X	0.1007
SUCTION S.P. (IN.) (-)	X	0.2556
REHEAT COIL △S.P. (IN.)	X	X
COOLING COIL △S.P. (IN.)	X	.1869 *
PREHEAT COIL △S.P. (IN.)	X	X
FILTERS △S.P. (IN.)	X	*
PREFILTER △S.P. (IN.)	X	X
FINAL FILTER △S.P. (IN.)	X	X
VORTEX DAMPER POSITION	X	X
OUT. AIR DAMP. POSITION	X	X
RET. AIR DAMP. POSITION	X	X

REMARKS:

BALANCED ON MEDIUM SPEED. LOW SPEED IS TOO LOW.

*- THE FILTERS AND COIL ARE LOCATED TOO CLOSE TOGETHER TO OBTAIN SEPARATE STATIC PRESSURE DROPS. THE DROP SHOWN FOR THE COOLING COIL ALSO INCLUDES THE FILTER DROP.

TEST DATES: 8/26/10 - 10/20/10

READINGS BY: C. ST. JOHN, C. ESTILL, J. POOL, M. BRIZENDINE, R. SEAMONS

AIR APPARATUS TEST REPORT

PROJECT: SMITH AQUATIC CENTER

SYSTEM/UNIT: GSHP-1B

LOCATION:

UNIT DATA	
MAKE	WATER FURNACE ENV.
MODEL	NDV026BR001NBRN
SERIAL	100300800
ARR./ CLASS	DWDI / I
DISCHARGE	VERTICAL
MAKE SHEAVE	DIRECT DRIVE
SHEAVE DIA./BORE	X
NO. BELTS/SIZE	X
NO. FILTERS/TYPE/SIZE	1 / PLEATED / 24X28X2

MOTOR DATA	
MAKE	GE
FRAME	48
H.P. / RPM	1/2 / 1020
VOLTS / PHASE / HZ.	208 / 1 / 60
F.L. AMPS / S.F.	4.0 / NG
MAKE SHEAVE	DIRECT DRIVE
SHEAVE DIA./BORE	X
SHEAVE C.L. DISTANCE	X
SHEAVE OPER. DIA.	X

TEST DATA	DESIGN	ACTUAL
TOTAL CFM	680	821
TOTAL S.P. (IN.)	X	0.2502
FAN RPM	DD	MED.
MOTOR VOLTS T1-T2 T2-T3 T3-T1	208	209
MOTOR AMPS T1 T2 T3	4.0	2.6
OUTSIDE AIR CFM	95	87
RETURN AIR CFM	585	734

TEST DATA	DESIGN	ACTUAL
DISCHARGE S.P. (IN.)	X	0.048
SUCTION S.P. (IN.) (-)	X	0.2022
REHEAT COIL △S.P. (IN.)	X	X
COOLING COIL △S.P. (IN.)	X	.1196 *
PREHEAT COIL △S.P. (IN.)	X	X
FILTERS △S.P. (IN.)	X	*
PREFILTER △S.P. (IN.)	X	X
FINAL FILTER △S.P. (IN.)	X	X
VORTEX DAMPER POSITION	X	X
OUT. AIR DAMP. POSITION	X	X
RET. AIR DAMP. POSITION	X	X

REMARKS:

BALANCED ON MEDIUM SPEED. LOW SPEED IS TOO LOW.

*- THE FILTERS AND COIL ARE LOCATED TOO CLOSE TOGETHER TO OBTAIN SEPARATE STATIC PRESSURE DROPS. THE DROP SHOWN FOR THE COOLING COIL ALSO INCLUDES THE FILTER DROP.

TEST DATES: 8/26/10 - 10/20/10

READINGS BY: C ST. JOHN, C. ESTILL, J. POOL, M. BRIZENDINE, R. SEAMONS

AIR APPARATUS TEST REPORT

PROJECT: SMITH AQUATIC CENTER

SYSTEM/UNIT: GSHP-1C

LOCATION:

UNIT DATA	
MAKE	WATER FURNACE ENV.
MODEL	NSV022BR00NBRN
SERIAL	103300898
ARR./ CLASS	DWDI / I
DISCHARGE	VERTICAL
MAKE SHEAVE	DIRECT DRIVE
SHEAVE DIA./BORE	X
NO. BELTS/SIZE	X
NO. FILTERS/TYPE/SIZE	24 / PLEATED / 24" X 28" X 2"

MOTOR DATA	
MAKE	GE
FRAME	48
H.P. / RPM	1/5 / 1050
VOLTS / PHASE / HZ.	208 / 1 / 60
F.L. AMPS / S.F.	1.2 / NG
MAKE SHEAVE	DIRECT DRIVE
SHEAVE DIA./BORE	X
SHEAVE C.L. DISTANCE	X
SHEAVE OPER. DIA.	X

TEST DATA	DESIGN	ACTUAL
TOTAL CFM	510	678
TOTAL S.P. (IN.)	X	0.5348
FAN RPM	DD	MED.
MOTOR VOLTS T1-T2 T2-T3 T3-T1	208	209
MOTOR AMPS T1 T2 T3	1.2	1.0
OUTSIDE AIR CFM	0	0
RETURN AIR CFM	510	678

TEST DATA	DESIGN	ACTUAL
DISCHARGE S.P. (IN.)	X	0.1867
SUCTION S.P. (IN.) (-)	X	0.3481
REHEAT COIL △S.P. (IN.)	X	X
COOLING COIL △S.P. (IN.)	X	.1518 *
PREHEAT COIL △S.P. (IN.)	X	X
FILTERS △S.P. (IN.)	X	*
PREFILTER △S.P. (IN.)	X	X
FINAL FILTER △S.P. (IN.)	X	X
VORTEX DAMPER POSITION	X	X
OUT. AIR DAMP. POSITION	X	X
RET. AIR DAMP. POSITION	X	X

REMARKS:

BALANCED ON MEDIUM SPEED. LOW SPEED IS TOO LOW.

*- THE FILTERS AND COIL ARE LOCATED TOO CLOSE TOGETHER TO OBTAIN SEPARATE STATIC PRESSURE DROPS. THE DROP SHOWN FOR THE COOLING COIL ALSO INCLUDES THE FILTER DROP.

TEST DATES: 8/26/10 - 10/20/10

READINGS BY: C. ST. JOHN, C. ESTILL, J. POOL, M. BRIZENDINE, R. SEAMONS

AIR APPARATUS TEST REPORT

PROJECT: SMITH AQUATIC CENTER

SYSTEM/UNIT: GSHP-2A

LOCATION:

UNIT DATA	
MAKE	WATER FURNACE ENV.
MODEL	NXC095TL30ANBR
SERIAL	100301022
ARR./ CLASS	DWDI / 1
DISCHARGE	VERITCAL
MAKE SHEAVE	MASTER DRIVE
SHEAVE DIA./BORE	8.9 X 1
NO. BELTS/SIZE	1 / A47
NO. FILTERS/TYPE/SIZE	2 / PLEATED / 28X36X2

MOTOR DATA	
MAKE	MARATHON
FRAME	56H
H.P. / RPM	1 1/2 / 1725
VOLTS / PHASE / HZ.	208 / 3 / 60
F.L. AMPS / S.F.	4.8 / 1.15
MAKE SHEAVE	BROWNING
SHEAVE DIA./BORE	4.0 X 5/8
SHEAVE C.L. DISTANCE	16
SHEAVE OPER. DIA.	95%

TEST DATA	DESIGN	ACTUAL
TOTAL CFM	2625	2624
TOTAL S.P. (IN.)	X	0.5347
FAN RPM	X	549
MOTOR VOLTS T1-T2 T2-T3 T3-T1	208	211/209/210
MOTOR AMPS T1 T2 T3	4.8	3.7/3.9/3.9
OUTSIDE AIR CFM	365	387
RETURN AIR CFM	2260	2223

TEST DATA	DESIGN	ACTUAL
DISCHARGE S.P. (IN.)	X	0.1614
SUCTION S.P. (IN.) (-)	X	0.3294
REHEAT COIL △S.P. (IN.)	X	X
COOLING COIL △S.P. (IN.)	X	.2812 *
PREHEAT COIL △S.P. (IN.)	X	X
FILTERS △S.P. (IN.)	X	*
PREFILTER △ S.P. (IN.)	X	X
FINAL FILTER △ S.P. (IN.)	X	X
VORTEX DAMPER POSITION	X	X
OUT. AIR DAMP. POSITION	X	X
RET. AIR DAMP. POSITION	X	X

REMARKS:

*- THE FILTERS AND COIL ARE LOCATED TOO CLOSE TOGETHER TO OBTAIN SEPARATE STATIC PRESSURE DROPS. THE DROP SHOWN FOR THE COOLING COIL ALSO INCLUDES THE FILTER DROP.

AIR APPARATUS TEST REPORT

PROJECT: SMITH AQUATIC CENTER **SYSTEM/UNIT: GSHP-2B**

LOCATION:

UNIT DATA	
MAKE	WATER FURNACE ENV.
MODEL	NXV095TL30ANB
SERIAL	100301023
ARR./ CLASS	DWDI / 1
DISCHARGE	VERTICAL
MAKE SHEAVE	MASTER DRIVE
SHEAVE DIA./BORE	8.9 X 1
NO. BELTS/SIZE	1 / A47
NO. FILTERS/TYPE/SIZE	2 / PLEATED / 28X36X2

MOTOR DATA	
MAKE	MARATHON
FRAME	56H
H.P. / RPM	1 1/2 / 1725
VOLTS / PHASE / HZ.	208 / 3 / 60
F.L. AMPS / S.F.	4.8 / 1.15
MAKE SHEAVE	BROWNING
SHEAVE DIA./BORE	4.0 X 5/8
SHEAVE C.L. DISTANCE	16 1/2
SHEAVE OPER. DIA.	85%

TEST DATA	DESIGN	ACTUAL
TOTAL CFM	2800	2828
TOTAL S.P. (IN.)	X	1.33
FAN RPM	X	699
MOTOR VOLTS T1-T2 T2-T3 T3-T1	208	210/208/208
MOTOR AMPS T1 T2 T3	4.8	4.3/4.5/3.7
OUTSIDE AIR CFM	1090	1159
RETURN AIR CFM	1710	1669

TEST DATA	DESIGN	ACTUAL
DISCHARGE S.P. (IN.)	X	0.7499
SUCTION S.P. (IN.) (-)	X	0.583
REHEAT COIL △S.P. (IN.)	X	X
COOLING COIL △S.P. (IN.)	X	.4204 *
PREHEAT COIL △S.P. (IN.)	X	X
FILTERS △S.P. (IN.)	X	*
PREFILTER △ S.P. (IN.)	X	X
FINAL FILTER △ S.P. (IN.)	X	X
VORTEX DAMPER POSITION	X	X
OUT. AIR DAMP. POSITION	X	X
RET. AIR DAMP. POSITION	X	X

REMARKS:

*- THE FILTERS AND COIL ARE LOCATED TOO CLOSE TOGETHER TO OBTAIN SEPARATE STATIC PRESSURE DROPS. THE DROP SHOWN FOR THE COOLING COIL ALSO INCLUDES THE FILTER DROP.

TEST DATES: 8/26/10 - 10/20/10

READINGS BY: C. ST. JOHN, C. ESTILL, J. POOL, M. BRIZENDINE, R. SEAMONS

AIR APPARATUS TEST REPORT

PROJECT: SMITH AQUATIC CENTER

SYSTEM/UNIT: GSHP-2C

LOCATION:

UNIT DATA	
MAKE	WATER FURNACE ENV.
MODEL	ND026TR001NBRN
SERIAL	100300801
ARR / CLASS	DWDI / 1
DISCHARGE	VERTICAL
MAKE SHEAVE	DIRECT DRIVE
SHEAVE DIA./BORE	X
NO. BELTS/SIZE	X
NO. FILTERS/TYPE/SIZE	1 / PLEATED / 24X28X2

MOTOR DATA	
MAKE	GE
FRAME	NG
H.P. / RPM	1/2 / 1020
VOLTS / PHASE / HZ.	208 / 1 /60
F.L. AMPS / S.F.	4 / NG
MAKE SHEAVE	DIRECT DRIVE
SHEAVE DIA./BORE	X
SHEAVE C.L. DISTANCE	X
SHEAVE OPER. DIA.	X

TEST DATA	DESIGN	ACTUAL
TOTAL CFM	680	675
TOTAL S.P. (IN.)	X	0.303
FAN RPM	DD	MED
MOTOR VOLTS T1-T2 T2-T3 T3-T1	208	209
MOTOR AMPS T1 T2 T3	4.0	13.0
OUTSIDE AIR CFM	265	253
RETURN AIR CFM	415	422

TEST DATA	DESIGN	ACTUAL
DISCHARGE S.P. (IN.)	X	0.1578
SUCTION S.P. (IN.) (-)	X	0.1452
REHEAT COIL △S.P. (IN.)	X	X
COOLING COIL △S.P. (IN.)	X	.0878 *
PREHEAT COIL △S.P. (IN.)	X	X
FILTERS △S.P. (IN.)	X	*
PREFILTER △S.P. (IN.)	X	X
FINAL FILTER △S.P. (IN.)	X	X
VORTEX DAMPER POSITION	X	X
OUT. AIR DAMP. POSITION	X	X
RET. AIR DAMP. POSITION	X	X

REMARKS:

*- THE FILTERS AND COIL ARE LOCATED TOO CLOSE TOGETHER TO OBTAIN SEPARATE STATIC PRESSURE DROPS. THE DROP SHOWN FOR THE COOLING COIL ALSO INCLUDES THE FILTER DROP.

AIR APPARATUS TEST REPORT

PROJECT: SMITH AQUATIC CENTER

SYSTEM/UNIT: GSHP-2D

LOCATION:

UNIT DATA	
MAKE	WATER FURNACE ENV.
MODEL	NDV064TR30110BAN
SERIAL	100300813
ARR / CLASS	DWDI / 1
DISCHARGE	VERITCAL
MAKE SHEAVE	DIRECT DRIVE
SHEAVE DIA./BORE	X
NO. BELTS/SIZE	X
NO. FILTERS/TYPE/SIZE	1 / PLEATED 24X28X2

MOTOR DATA	
MAKE	GE
FRAME	NG
H.P. / RPM	1 / 1050
VOLTS / PHASE / HZ.	208 / 1 / 60
F.L. AMPS / S.F.	7 / NG
MAKE SHEAVE	DIRECT DRIVE
SHEAVE DIA./BORE	X
SHEAVE C.L. DISTANCE	X
SHEAVE OPER. DIA.	X

TEST DATA	DESIGN	ACTUAL
TOTAL CFM	1700	1723
TOTAL S.P. (IN.)	X	0.2481
FAN RPM	DD	HIGH
MOTOR VOLTS T1-T2 T2-T3 T3-T1	208	210
MOTOR AMPS T1 T2 T3	7.0	0.8
OUTSIDE AIR CFM	960	989
RETURN AIR CFM	740	734

TEST DATA	DESIGN	ACTUAL
DISCHARGE S.P. (IN.)	X	0.0463
SUCTION S.P. (IN.) (-)	X	0.2018
REHEAT COIL △S.P. (IN.)	X	X
COOLING COIL △S.P. (IN.)	X	.1804 *
PREHEAT COIL △S.P. (IN.)	X	X
FILTERS △S.P. (IN.)	X	*
PREFILTER △S.P. (IN.)	X	X
FINAL FILTER △S.P. (IN.)	X	X
VORTEX DAMPER POSITION	X	X
OUT. AIR DAMP. POSITION	X	X
RET. AIR DAMP. POSITION	X	X

REMARKS:

*. THE FILTERS AND COIL ARE LOCATED TOO CLOSE TOGETHER TO OBTAIN SEPARATE STATIC PRESSURE DROPS. THE DROP SHOWN FOR THE COOLING COIL ALSO INCLUDES THE FILTER DROP.

TEST DATES: 8/26/10 - 10/20/10

READINGS BY: C. ST. JOHN, C. ESTILL, J. POOL, M. BRIZENDINE, R. SEAMONS

ENERGY RECOVERY UNIT
TEST REPORT

PROJECT: SMITH AQUATIC CENTER

SYSTEM/UNIT: ERV-1

LOCATION:

UNIT DATA		
MAKE	GREENHECK	
MODEL	ERV-S215-15-D-ES	
SERIAL	11926833	

FAN DATA	SUPPLY FAN	EXHAUST FAN
ARR./ CLASS	DWDI / 1	DWDI / 1
DISCHARGE	HORIZONTAL	HORIZONTAL
MAKE SHEAVE	POWER DRIVE	POWER DRIVE
SHEAVE DIA./BORE	5.0 X 1 1/8	5 X 1 1/8
NO. BELTS/SIZE	1 / DAX48	1 / AP47
NO. FILTERS/TYPE/SIZE	3 / PLEATED /	3 / PLEATED /
	16X25X2	16X25X2

MOTOR DATA	SUPPLY FAN	EXHAUST FAN
MAKE	BALDOR	MARATHON
FRAME	182T	143T
H.P. / RPM	3 / 1725	1 / 1725
VOLTS / PHASE / HZ.	208 / 3 /60	208 / 3 / 60
F.L. AMPS / S.F.	8.7 / 1.15	3.3 / 1.15
MAKE SHEAVE	POWERDRIVE	POWERDRIVE
SHEAVE DIA./BORE	5.9 X 1	4.0 X 7/8
SHEAVE C.L. DISTANCE	17	17
SHEAVE OPER. DIA.	90%	80%

SUPPLY FAN TEST DATA	DESIGN	ACTUAL
TOTAL CFM SUPPLY	3215	3400
TOTAL S.P. (IN.)	X	1.322
FAN RPM	1725	1340
MOTOR VOLTS T1-T2 T2-T3 T3-T1	208	211/212/213
MOTOR AMPS T1 T2 T3	8.7	7.3/7.8/7.4

EXHAUST FAN TEST DATA	DESIGN	ACTUAL
TOTAL CFM EXHAUST	2010	1818
TOTAL SP. (IN.)	X	0.8925
FAN RPM	1725	999
MOTOR VOLTS	208	211/212/213
MOTOR AMPS	3.3	3.1/3.3/3.2

SUPPLY FAN TEST DATA	DESIGN	ACTUAL
DISCHARGE S.P. (IN.)	X	0.0563
SUCTION S.P. (IN.) (-)	X	1.266
HEAT PIPE COIL Δ P (IN.)	X	X
COOLING COIL Δ P (IN.)	X	X
ENERGY WHEEL Δ P (IN.)	X	0.8355
PREHEAT COIL Δ P (IN.)	X	X
FILTER Δ P. (IN.)	X	0.2293
FINAL FILTER Δ P. (IN.)	X	X

EXHAUST FAN TEST DATA	DESIGN	ACTUAL
DISCHARGE S.P. (IN.)	X	0.0704
SUCTION S.P. (IN.) (-)	X	0.8221
ENERGY WHEEL Δ P (IN.)	X	0.5007
HEAT PIPE COIL Δ P (IN.)	X	X
FILTER Δ P. (IN.)	X	0.0898

REMARKS:

TEST DATE: 8/26/10 - 10/20/10
REVISED: 2/8/11

READINGS BY: C. ST JOHN, C.ESTILL, J.POOL
M.BRIZENDINE & R.SEAMONS

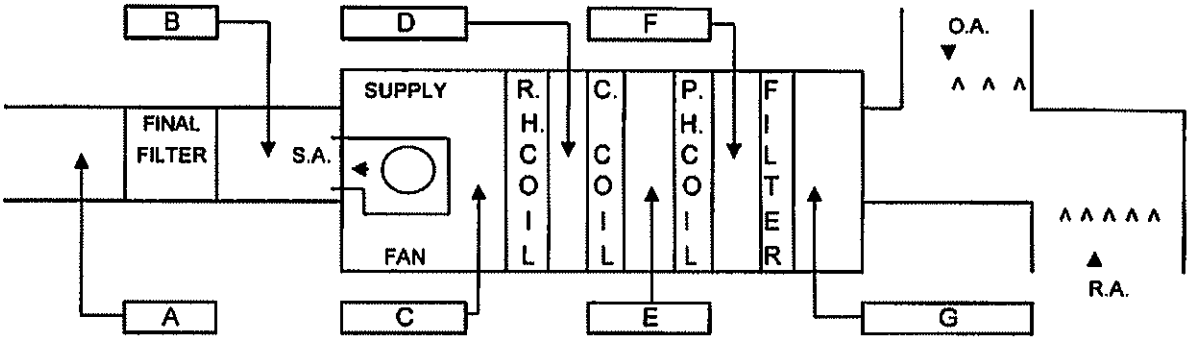
MID ATLANTIC TEST & BALANCE, INC.

STATIC PRESSURE PROFILE REPORT

PROJECT: SMITH AQUATIC CENTER

LOCATION:

STATIC PRESSURE PROFILE



UNIT NUMBER	A	B	C	D	E	F	G
PDU-1	X	0.078	3.532	2.53	1.296	1.054	0.6359
PDU-2	X	0.2282	3.725	2.651	1.354	0.9608	0.5005
GSHP-1A	X	0.1007	0.2556	X	X	X	0.0687
GSHP-2A	X	0.048	0.2022	X	X	X	0.0826
GSHP-1C	X	0.1867	0.3481	X	X	X	0.1963
GSHP-2A	X	0.1783	0.3564	X	X	X	0.0662
GSHP-2B	X	0.7499	0.583	X	X	X	0.1626
GSHP-2C	X	0.1578	0.1452	X	X	X	0.0574
GSHP-2D	X	0.0463	0.2018	X	X	X	0.0214

REMARKS:

TEST DATES: 8/26/10 - 10/20/10

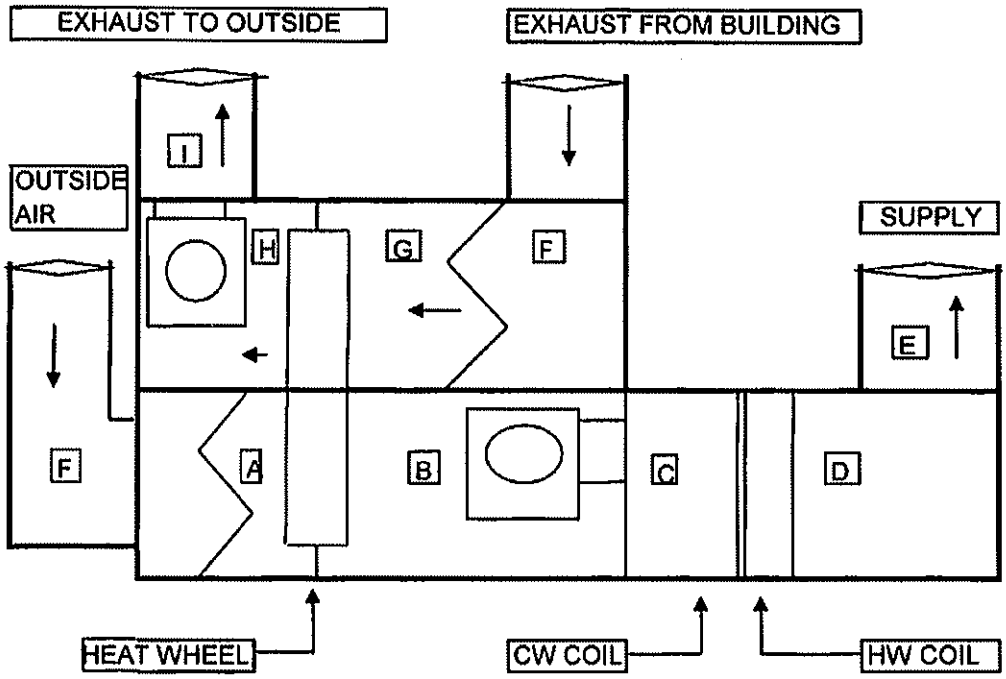
READINGS BY: C, ST JOHN, C.ESTIL, J.POOL
M.BRIZENDINE & R.SEAMONS

ENERGY RECOVERY UNIT
STATIC PRESSURE PROFILE

PROJECT: SMITH AQUATIC CENTER

LOCATION

STATIC PRESSURE PROFILE



UNIT NUMBER	A	B	C	D	E	F	G	H	I	J
ERV-1	0.2012	0.4305	1.266	X	X	0.0563	0.2316	0.324	0.8221	0.0704

REMARKS:

AIR OUTLET TEST REPORT

PROJECT: SMITH AQUATIC CENTER | **SYSTEM: HEAT PUMP SUPPLY AIR**

OUTLET MANUFACTURER: | **TEST APPARATUS: SHORTRIDGE FLOW HOOD**

AREA SERVED	OUTLET			DESIGN		PRELIMINARY		FINAL		
	NO.	TYPE	SIZE (IN.)	VEL.	CFM	VEL	CFM	VEL.	CFM	PERCENT OF DESIGN
GSHP-2D										
FITNESS / MULTI	1	LSD-1	10		285				307	107.72%
FITNESS / MULTI	2	LSD-1	10		285				288	101.05%
FITNESS / MULTI	3	LSD-1	10		275				300	109.09%
FITNESS / MULTI	4	LSD-1	10		285				265	92.98%
FITNESS / MULTI	5	LSD-1	10		285				289	101.40%
FITNESS / MULTI	6	LSD-1	10		285				275	96.49%
GSHP-2C *										
MULT 212	1	LSD-1	8		195		94		183	93.85%
MULT 212	2	LSD-1	8		195		126		189	96.92%
MULT 212	3	LSD-1	8		190		130		197	103.68%
WOMENS 200	4	CD-1	6		20		71		21	105.00%
MENS	5	CD-1	6		20		45		22	110.00%
CORR 211A	6	CD-1	6		60		65		63	105.00%
GSHP-2A										
RECEPTION 205	1	SWSG-1	6		80				81	101.25%
OFFICE 204	2	CD-1	6		80				79	98.75%
OFFICE 203	3	CD-1	6		80				83	103.75%
OFFICE 202	4	CD-1	6		80				84	105.00%
LOBBY 201	5	SWSG-1	30X8		460				469	101.96%
LOBBY 201	6	SWSG-1	30X8		460				452	98.26%
LOBBY 201	7	SWSG-1	30X8		460				453	98.48%
LOBBY 201	8	SWSG-1	30X8		460				461	100.22%
LOBBY 201	9	SWSG-1	30X8		465				462	99.35%

REMARKS:
*-MEDIUM SPEED.

TEST DATES: 8/26/10 - 10/20/10

READINGS BY: C. ST JOHN, C.ESTILL, J.POOL
M.BRIZENDINE & R.SEAMONS

AIR OUTLET TEST REPORT

PROJECT: SMITH AQUATIC CENTER

SYSTEM: HEAT PUMP SUPPLY AIR

OUTLET MANUFACTURER:

TEST APPARATUS: SHORTRIDGE FLOW HOOD

AREA SERVED	OUTLET			DESIGN		PRELIMINARY		FINAL		
	NO.	TYPE	SIZE (IN.)	VEL.	CFM	VEL	CFM	VEL.	CFM	PERCENT OF DESIGN
GSHP-2B										
FITNESS 213	1	LSD-SP	24		280				279	99.64%
FITNESS 213	2	LSD-SP	24		280				274	97.86%
FITNESS 213	3	LSD-SP	24		280				271	96.79%
FITNESS 213	4	LSD-SP	24		280				284	101.43%
FITNESS 213	5	LSD-SP	24		280				277	98.93%
FITNESS 213	6	LSD-SP	24		280				281	100.36%
FITNESS 213	7	LSD-SP	24		280				292	104.29%
FITNESS 213	8	LSD-SP	24		280				287	102.50%
FITNESS 213	9	LSD-SP	24		280				296	105.71%
FITNESS 213	10	LSD-SP	24		280				287	102.50%
GSHP-1A *										
LIFEGUARD 114	1	CD-1	8		120		285		140	116.67%
WET CLASSROOM 110	2	LSD-1	10		290		454		343	118.28%
WET CLASSROOM 110	3	LSD-1	10		290		422		322	111.03%
WET CLASSROOM 110	4	LSD-1	10		290		91		313	107.93%
WET CLASSROOM 110	5	LSD-1	10		290		505		355	122.41%
AQUATIC DIR 115	6	CD-1	6		80		176		90	112.50%
GSHP-1C*										
WOMEN 108	1	CD-1	8		170		235		224	131.76%
WOMEN 108	2	CD-1	8		170		103		226	132.94%
WOMEN 108	3	CD-1	8		170		313		228	134.12%

REMARKS:

*- BALANCED ON MEDIUM SPEED. LOW SPEED IS TOO LOW.

AIR OUTLET TEST REPORT

PROJECT: SMITH AQUATIC CENTER

SYSTEM: HEAT PUMP SUPPLY AIR

OUTLET MANUFACTURER:

TEST APPARATUS: SHORTRIDGE FLOW HOOD

AREA SERVED	OUTLET			DESIGN		PRELIMINARY		FINAL		
	NO.	TYPE	SIZE (IN.)	VEL.	CFM	VEL	CFM	VEL.	CFM	PERCENT OF DESIGN
GSHP-1B *										
FAMILY 102	1	CD-1	8		150		216		172	114.67%
CHANGE 103	2	CD-1	4		20		55		24	120.00%
CHANGE 104	3	CD-1	4		20		52		23	115.00%
LOBBY 101	4	LSD-1	8		110		150		135	122.73%
JAN 106	5	SWSG-1	6		20		36		24	120.00%
MEN 107	6	CD-1	8		120		195		149	124.17%
MEN 107	7	CD-1	8		120		186		145	120.83%
MEN 107	8	CD-1	8		120		195		148	123.33%

REMARKS:

*- BALANCED ON MEDIUM SPEED. LOW SPEED IS TOO LOW

TEST DATES: 8/26/10 - 10/20/10

READINGS BY: C. ST JOHN, C.ESTILL, J.POOL M.BRIZENDINE & R.SEAMONS

AIR OUTLET
TEST REPORT

PROJECT: SMITH AQUATIC CENTER **SYSTEM: RETURN**

OUTLET MANUFACTURER: **TEST APPARATUS: SHORTRIDGE FLOW HOOD**

AREA SERVED	OUTLET			DESIGN		PRELIMINARY		FINAL		
	NO.	TYPE	SIZE (IN.)	VEL.	CFM	VEL	CFM	VEL.	CFM	PERCENT OF DESIGN
GSHP-1A*										
LIFEGUARD 114	1	CRG-1	18X18		70		84		90	128.57%
AQUATICS 115	2	CRG-1	18X18		70		110		95	135.71%
WET CLASSROOM 110	3	CRG-1	18X18		745		880		978	131.28%
GSHP-1B*										
LOBBY 101	1	LSD-R	12		585				734	125.47%
GSHP-1C*										
LOBBY 101	1	LSD-R	12		510				678	132.94%
GSHP-2A**										
OFFICE 202	1	CRG-1	12X12		75		23		51	68.00%
OFFICE 203	2	CRG-1	12X12		75		14		43	57.33%
RECEPTION	3	CRG-1	24X48		2305		1464		1285	55.75%
GSHP-2B										
FITNESS 213	1	SWRG-1	24X48		1770				1669	94.29%
GSHP-2C*										
MULTI 213	1	CRG-1	12X48		335				422	125.97%
GSHP-2D**										
FITNESS 214	1	CRG-1	48X12		900				735	81.67%

REMARKS:

*- UNIT TOTAL AIRFLOW IS HIGH WHICH INCREASED THE RETURN AIRFLOW.

**- THE AIRFLOW DESIGNATED THROUGH THE RETURN GRILLES ON THE PLANS IS BASED ON TOTAL BEFORE ALLOWING THE SUBTRACTION OF THE OUTISDE AIR.

TEST DATES: 8/26/10 - 10/20/10

READINGS BY: C. ST JOHN, C.ESTILL, J.POOL
M.BRIZENDINE & R.SEAMONS

AIR OUTLET TEST REPORT

PROJECT: SMITH AQUATIC CENTER **SYSTEM: EXHAUST**

OUTLET MANUFACTURER: **TEST APPARATUS: SHORTRIDGE FLOW HOOD**

AREA SERVED	OUTLET			DESIGN		PRELIMINARY		FINAL		
	NO.	TYPE	SIZE (IN.)	VEL.	CFM	VEL	CFM	VEL.	CFM	PERCENT OF DESIGN
ERV-1										
MEN	1	CEG-1	6		75		116		69	92.00%
WOMEN	2	CEG-1	6		75		121		75	100.00%
CHANGE RM 104	3	CEG-2	6		95		73		89	93.68%
CHANGE RM 103	4	CEG-2	6		95		51		87	91.58%
LOCKERS 107A	5	CEG-1	8		125		186		116	92.80%
LOCKERS 107A	6	CEG-1	8		125		123		117	93.60%
TOILET 107B	7	CEG-1	12X18		380		360		359	94.47%
RECYCLING 105	8	SWEG-1	12X6		125		126		127	101.60%
LOCKERS 108A	9	CEG-1	18X18		125		258		117	93.60%
LOCKERS 108A	10	CEG-1	6		100		127		94	94.00%
TOILET 108B	11	CEG-1	10		300		0		271	90.33%
TOILET 108B	12	CEG-1	18X18		250		274		236	94.40%
JANITOR 106	13	CEG-1	10X4		50		32		47	94.00%
LOCKER 107A	14	CEG-1	6X6		60		145		58	96.67%
LOCKER 108A	15	CEG-1	6X6		60		0		54	90.00%

REMARKS:

TEST DATES: 8/26/10 - 10/20/10

READINGS BY: C. ST JOHN, C.ESTILL, J.POOL M.BRIZENDINE & R.SEAMONS

FAN TEST REPORT

PROJECT: SMITH AQUATIC CENTER

FAN DATA	FAN NO. EF-1		FAN NO. EF-2		FAN NO. EF-3	
LOCATION	CEILING		CEILING		CEILING	
SERVICE	EXHAUST		EXHAUST		EXHAUST	
MANUFACTURER	GREENHECK		GREENHECK		GREENHECK	
MODEL NUMBER	CSP-A110-QD		CSPA250QD		CSP-A110-QD	
SERIAL NUMBER	11975731		11978082		11975716	
TYPE CLASS	INLINE		INLINE		CABINET	
MOTOR MAKE/STYLE	FASCO		FASCO		FASCO	
MOTOR H.P./R.P.M./FRAME	1/154 / 950 / NG		NG / 1000 / NG		1 / 154 / 950 / NG	
VOLTS/PHASE/HERTZ	115 / 1 / 60		115 / 1 / 60		115 / 1 / 60	
F.L. AMPS/S.F.	0.5 / NG		0.8 / NG		0.5 / NG	
MOTOR SHEAVE MAKE/MODEL	DIRECT DRIVE		DIRECT DRIVE		DIRECT DRIVE	
MOTOR SHEAVE DIA./BORE	X		X		X	
FAN SHEAVE MAKE	X		X		X	
FAN SHEAVE DIAM./BORE	X		X		X	
NO. BELTS/SIZE	X		X		X	
SHEAVE C.L. DISTANCE	X		X		X	
TEST DATA	**DESIGN**	**ACTUAL**	**DESIGN**	**ACTUAL**	**DESIGN**	**ACTUAL**
CFM	100	94	220	213	75	73
FAN R.P.M.	X	DD	X	DD	X	DD
S.P. IN/OUT (IN.)	X	0.0872	X	0.0166	X	.0061/X
TOTAL S.P. (IN.)	X	0.0872	X	0.0166	X	0.0061
VOLTAGE T1-T2/T2-T3/T3-T1	115	120	115	121	115	121
AMPERAGE T_1 T_2 T_3	0.5	0.5	0.8	0.7	0.5	0.5

REMARKS:

TEST DATE: 8/26/10-10/20/10

READINGS BY: C. ST JOHN, C.ESTILL, J.POOL
M.BRIZENDINE & R.SEAMONS

FAN TEST REPORT

PROJECT: SMITH AQUATIC CENTER

FAN DATA	FAN NO. EF-4		FAN NO. EF-5		FAN NO.	
LOCATION	CEILING		CEILING			
SERVICE	EXHAUST		EXHAUST			
MANUFACTURER	GREENEHCK		GREENHECK			
MODEL NUMBER	NA		CSP-A110-QD			
SERIAL NUMBER	NA		11975734			
TYPE CLASS	INLINE		INLINE			
MOTOR MAKE/STYLE	FASCO		FASCO			
MOTOR H.P./R.P.M./FRAME	NG / 1100 / NG		1/154 / 950 / NG			
VOLTS/PHASE/HERTZ	115 / 1 / 60		115 / 1 / 60			
F.L. AMPS/S.F.	3.5 / NG		0.5 / NG			
MOTOR SHEAVE MAKE/MODEL	DIRECT DRIVE		DIRECT DRIVE			
MOTOR SHEAVE DIA./BORE	X		X			
FAN SHEAVE MAKE	X		X			
FAN SHEAVE DIAM./BORE	X		X			
NO. BELTS/SIZE	X		X			
SHEAVE C.L. DISTANCE	X		X			
TEST DATA	**DESIGN**	**ACTUAL**	**DESIGN**	**ACTUAL**	**DESIGN**	**ACTUAL**
CFM	650	587	75	81		
FAN R.P.M.	X	DD	X	DD		
S.P. IN/OUT (IN.)	X	0.3299	X	0.0419		
TOTAL S.P. (IN.)	X	0.3299	X	0.0419		
VOLTAGE $T_{1\text{-}T2/T2\text{-}T3/T3\text{-}T1}$	115	120	115	121		
AMPERAGE T_1 T_2 T_3	3.5	2.7	0.5	0.4		

REMARKS:

FAN TEST REPORT

PROJECT: SMITH AQUATIC CENTER

FAN DATA	FAN NO. PDU-1		FAN NO. PDU-2		FAN NO.	
LOCATION	MECH RM		MECH RM			
SERVICE	EXHAUST		EXHAUST			
MANUFACTURER	MUNTERS		MUNTERS			
MODEL NUMBER	PV-W1S-PMV		PV-W1S-PMV			
SERIAL NUMBER	58345		58345			
TYPE CLASS	DWDI / 1		DWDI / 1			
MOTOR MAKE/STYLE	WEG		WEG			
MOTOR H.P./R.P.M./FRAME	3 / 1760 / 182T		3 / 1760 / 182T			
VOLTS/PHASE/HERTZ	208 / 3 / 60		208 / 3 / 60			
F.L. AMPS/S.F.	8.9 / 1.15		8.9 / 1.15			
MOTOR SHEAVE MAKE/MODEL	BROWNING		BROWNING			
MOTOR SHEAVE DIA./BORE	7.1 X 1 1/8		7.1 X 1 1/8			
FAN SHEAVE MAKE	BROWNING		BROWNING			
FAN SHEAVE DIAM./BORE	8.0 X 1 3/16		8.0 X 1 3/16			
NO. BELTS/SIZE	1 / AX45		1 / AX45			
SHEAVE C.L. DISTANCE						
TEST DATA	**DESIGN**	**ACTUAL**	**DESIGN**	**ACTUAL**	**DESIGN**	**ACTUAL**
CFM	3710	3775	3710	3825		
FAN R.P.M.	X	1279	X	1308		
S.P. IN/OUT (IN.)	X	1.138/.3193	X	1.51/.3083		
TOTAL S.P. (IN.)	X	1.457	X	2.01		
VOLTAGE T1-T2/T2-T3/T3-T1	208	203/203/204	208	203/204/203		
AMPERAGE T_1 T_2 T_3	8.9	8.9/8.8/8.9	8.9	8.3/8.7/8.3		

REMARKS:

DUCT TRAVERSE REPORT

PROJECT: SMITH AQUATIC CENTER

SYSTEM/UNIT: ERV-1

LOCATION:

SERVICE: SUPPLY

ALTITUDE:

DENSITY: STANDARD AIR

CORRECTION FACTOR:

DUCT		REQUIRED	ACTUAL
S.P.: 0.1170	AIR TEMP:	SCFM	SCFM
SIZE: 36X16	AREA: 4.00	FPM: 803 CFM: 3215	FPM: 850 CFM: 3400

POSTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14
A	1016	862	921	840	825	845								
B	982	938	815	739	768	813								
C	1002	784	664	670	777	804								
D	865	6	917	885	707	946								
E														
F														
G														
H														
I														
J														
K														
L														
M														
N														
VELOCITY SUBTOTALS														

REMARKS:

TEST DATE: 8/26/10 - 10/20/10

READINGS BY: C. ST JOHN, C.ESTILL, J.POOL, M.BRIZENDINE & R.SEAMONS

DUCT TRAVERSE REPORT

PROJECT: SMITH AQUATIC CENTER

SYSTEM/UNIT: GSHP-2A

LOCATION:

SERVICE: SUPPLY

ALTITUDE:

DENSITY: STANDARD AIR

CORRECTION FACTOR:

DUCT		REQUIRED		ACTUAL	
S.P.: .1104	AIR TEMP:		SCFM		SCFM
SIZE: 20 X 24	AREA: 3.33	FPM:	CFM:	FPM: 1651	CFM: 2168

POSTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14
A	559	652	646	613										
B	658	745	713	643										
C	613	699	717	647										
D	597	589	699	625										
E														
F														
G														
H														
I														
J														
K														
L														
M														
N														
VELOCITY SUBTOTALS														

REMARKS:

TEST DATE: 8/26/10 - 10/20/10

READINGS BY: C. ST JOHN, C.ESTILL, J.POOL, M.BRIZENDINE & R.SEAMONS

DUCT TRAVERSE REPORT

PROJECT: SMITH AQUATIC CENTER

SYSTEM/UNIT: GSHP-2B

LOCATION:

SERVICE: SUPPLY

ALTITUDE:

DENSITY: STANDARD AIR

CORRECTION FACTOR:

DUCT					REQUIRED					ACTUAL				
S.P.: .1196		AIR TEMP:			SCFM					SCFM				
SIZE: 26 X 26		AREA: 4.69			FPM: 597		CFM: 2800			FPM: 603		CFM: 2828		
POSTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14
A	739	952	432	686	816									
B	901	1655	522	899	209									
C	1038	534	503	1111	318									
D	729	457	545	1328	754									
E	221	426	545	1265	717									
F														
G														
H														
I														
J														
K														
L														
M														
N														
VELOCITY SUBTOTALS														

REMARKS:

TEST DATE: 8/26/10 - 10/20/10

READINGS BY: C. ST JOHN, C.ESTILL, J.POOL, M.BRIZENDINE & R.SEAMONS

DUCT TRAVERSE REPORT

PROJECT: SMITH AQUATIC CENTER

SYSTEM/UNIT: PDU-1

LOCATION:

SERVICE: EXHAUST

ALTITUDE:

DENSITY: STANDARD AIR

CORRECTION FACTOR:

DUCT					REQUIRED					ACTUAL				
S.P.:		AIR TEMP:			SCFM					SCFM				
SIZE: 20 X 20		AREA: 2.77			FPM: 1339 CFM: 3710					FPM: 1363 CFM: 3775				
POSTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14
A	2165	1847	1267	305										
B	1563	1627	1836	264										
C	1650	1493	1837	316										
D	2166	2134	1215	123										
E														
F														
G														
H														
I														
J														
K														
L														
M														
N														
VELOCITY SUBTOTALS														

REMARKS:

DUCT TRAVERSE REPORT

PROJECT: SMITH AQUATIC CENTER

SYSTEM/UNIT: PDU-2

LOCATION:

SERVICE: EXHAUST

ALTITUDE:

DENSITY: STANDARD AIR

CORRECTION FACTOR:

DUCT		REQUIRED		ACTUAL	
S.P.:	AIR TEMP:	SCFM		SCFM	
SIZE: 20 X 20	AREA: 2.77	FPM: 1339	CFM: 3710	FPM: 1381	CFM: 3825

POSTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14
A	1307	1252	1184	1218										
B	1512	1530	1204	860										
C	1805	1551	1105	1265										
D	1898	1703	1283	1413										
E														
F														
G														
H														
I														
J														
K														
L														
M														
N														
VELOCITY SUBTOTALS														

REMARKS:

DUCT TRAVERSE REPORT

PROJECT: SMITH AQUATIC CENTER

SYSTEM/UNIT: PDU-1

LOCATION:

SERVICE: OA

ALTITUDE:

DENSITY: STANDARD AIR

CORRECTION FACTOR:

DUCT			REQUIRED		ACTUAL	
S.P.: .3792	AIR TEMP:		SCFM		SCFM	
SIZE: 72 X 8	AREA: 4.00		FPM: 756	CFM: 3025	FPM: 760	CFM: 3040

POSTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14
A	661	508	671	667	704	733	783	880	1113	904	-163	-303		
B	821	791	664	944	870	622	698	840	1269	686	107	-196		
C	934	827	994	901	1034	801	1079	1090	1217	986	217	-220		
D	1155	1033	1111	1089	1036	969	968	1092	1095	1099	575	97		
E														
F														
G														
H														
I														
J														
K														
L														
M														
N														
VELOCITY SUBTOTALS														

REMARKS:

DUCT TRAVERSE REPORT

PROJECT: SMITH AQUATIC CENTER

SYSTEM/UNIT: PDU-2

LOCATION:

SERVICE: OA

ALTITUDE:

DENSITY: STANDARD AIR

CORRECTION FACTOR:

DUCT					REQUIRED					ACTUAL				
S.P.:		AIR TEMP:			SCFM					SCFM				
SIZE: 72 X 8		AREA: 4.00			FPM: 756		CFM: 3025			FPM: 779		CFM: 3116		
POSTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14
A	710	694	694	769	939	914	733	789	569	1041	836	755		
B	584	550	506	592	857	965	891	1011	865	1029	837	652		
C	529	482	456	511	836	930	968	1098	1032	1055	877	715		
D	617	477	473	413	766	934	932	1131	1127	723	720	692		
E														
F														
G														
H														
I														
J														
K														
L														
M														
N														
VELOCITY SUBTOTALS														

REMARKS:

DUCT TRAVERSE REPORT

PROJECT: SMITH AQUATIC CENTER

SYSTEM/UNIT: GSHP-1A

LOCATION:

SERVICE: OA

ALTITUDE:

DENSITY: STANDARD AIR

CORRECTION FACTOR:

DUCT		REQUIRED		ACTUAL	
S.P.: 0.0674	AIR TEMP:	SCFM		SCFM	
SIZE: 8X12	AREA: 0.66	FPM: 660	CFM: 440	FPM: 602	CFM: 400

POSTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14
A	592	630	663	541										
B	742	594	579	574										
C	594	601	580	588										
D	567	607	595	578										
E														
F														
G														
H														
I														
J														
K														
L														
M														
N														
VELOCITY SUBTOTALS														

REMARKS:

DUCT TRAVERSE REPORT

PROJECT: SMITH AQUATIC CENTER

SYSTEM/UNIT: GSHP-2D

LOCATION:

SERVICE: OA

ALTITUDE:

DENSITY: STANDARD AIR

CORRECTION FACTOR:

DUCT		REQUIRED		ACTUAL	
S.P.: 0.0677	AIR TEMP:		SCFM		SCFM
SIZE: 12X14	AREA: 1.16	FPM: 827	CFM: 960	FPM: 825	CFM: 989

POSTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14
A	859	942	1015	1097										
B	752	774	832	893										
C	604	758	796	842										
D	611	76	793	906										
E														
F														
G														
H														
I														
J														
K														
L														
M														
N														
VELOCITY SUBTOTALS														

REMARKS:

DUCT TRAVERSE REPORT

PROJECT: SMITH AQUATIC CENTER

SYSTEM/UNIT: PDU-2

LOCATION: LOWER LEVEL

SERVICE: SUPPLY

ALTITUDE:

DENSITY: STANDARD AIR

CORRECTION FACTOR:

DUCT		REQUIRED		ACTUAL	
S.P.: 0.1556	AIR TEMP:		SCFM		SCFM
SIZE: 22 X 20	AREA: 4.44	FPM: 557	CFM: 2475	FPM: 612	CFM: 2690

POSTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14
A	964	858	849	777	695	746								
B	917	725	425	445	348	410								
C	807	662	482	413	296	222								
D	1037	790	587	660	287	305								
E														
F														
G														
H														
I														
J														
K														
L														
M														
N														
VELOCITY SUBTOTALS														

REMARKS:

TEST DATE: 8/26/10 - 10/20/10
REVISED:

READINGS BY: C. ST JOHN, C.ESTILL, J.POOL, M.BRIZENDINE & R.SEAMONS

DUCT TRAVERSE REPORT

PROJECT: SMITH AQUATIC CENTER

SYSTEM/UNIT: PDU-1

LOCATION: LOWER LEVEL

SERVICE: RETURN

ALTITUDE:

DENSITY: STANDARD AIR

CORRECTION FACTOR:

DUCT		REQUIRED		ACTUAL	
S.P.: 0.5500	AIR TEMP:		SCFM		SCFM
SIZE: 52 X 48	AREA: 17.33	FPM:	CFM:	FPM: 1105	CFM: 19149

POSTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14
A	315	357	602	578	794	1359	1637	1774						
B	781	955	708	776	1260	1482	1651	1694						
C	351	308	375	876	1419	1488	1621	2053						
D	O	O	338	514	1039	1577	1621	2234						
E	320	336	476	736	1239	1631	1724	2099						
F	789	898	873	1125	1447	159	1701	2115						
G	O	486	956	1223	1417	1543	1677	2120						
H	O	389	789	1309	1421	1574	1683	2011						
I	O	351	1031	1279	1461	1561	1703	1988						
J														
K														
L														
M														
N														
VELOCITY SUBTOTALS														

REMARKS:

TEST DATE: 8/26/10 - 10/20/10
REVISED:

READINGS BY: C. ST JOHN, C.ESTILL, J.POOL, M.BRIZENDINE & R.SEAMONS

DUCT TRAVERSE REPORT

PROJECT: SMITH AQUATIC CENTER

SYSTEM/UNIT: PDU-2

LOCATION: LOWER LEVEL

SERVICE: RETURN

ALTITUDE:

DENSITY: STANDARD AIR

CORRECTION FACTOR:

DUCT					REQUIRED					ACTUAL				
S.P.: 0.3521		AIR TEMP:			SCFM					SCFM				
SIZE: 94 X 26		AREA: 16.97			FPM:		CFM:			FPM: 1079		CFM: 18310		
POSTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14
A	796	347	719	1005	1098	1224	1596	1633	1592	1881	1769	1783	1156	655
B	748	400	697	895	887	1311	1590	1647	1749	1877	1709	1334	886	O
C	851	289	755	995	1123	1531	1593	1528	1709	1791	1754	1483	834	O
D	724	628	793	1200	1530	1673	1549	1529	1529	1707	1883	1611	1018	155
E	787	641	758	1469	1268	1463	1517	1543	1467	1463	1613	1689	1557	544
F														
G	15	16												
H	522	409												
I	O	O												
J	O	O												
K	O	431												
L	402	O												
M														
N														
VELOCITY SUBTOTALS														

REMARKS:

TEST DATE: 8/26/10 - 10/20/10
REVISED:

READINGS BY: C. ST JOHN, C.ESTILL, J.POOL, M.BRIZENDINE & R.SEAMONS

ROUND DUCT TRAVERSE REPORT

PROJECT: SMITH AQUATIC CENTER

SYSTEM/UNIT: GSHP-1B

LOCATION:

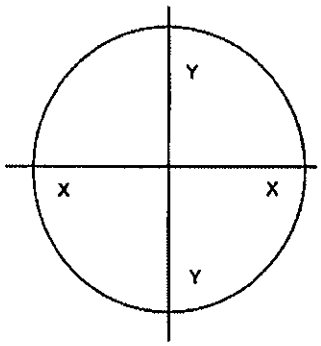
SERVICE: OA

DENSITY: STANDARD AIR

CORRECTION FACTOR:

DUCT				REQUIRED				ACTUAL			
S.P.:	0.078	AIR TEMP:		SCFM				SCFM			
SIZE:	6	AREA:	0.20 (sq.ft.)	FPM:	484	CFM:	95	FPM:	445	CFM:	87

PRELIMINARY			
POINT	DISTANCE	X - X FPM	Y - Y FPM
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
SUB TOTALS			
NO. OF POINTS			
AVE. VELOCITY			
CFM			



FINAL			
POINT	DISTANCE	X - X FPM	Y - Y FPM
1		503	467
2		401	467
3		456	420
4		457	407
5		455	25
6		443	40
7			
8			
9			
10			
SUB TOTALS		2715	1826
NO. OF POINTS		6	6
AVE. VELOCITY		453	304
CFM		87	

REMARKS:

CALCULATED PITOT TUBE TRAVERE POINTS

POINT	%	4	6	8	%	10	12	%	14	16	18	20	22	24	26	28	30	32
1	0.044	1/8	1/4	3/8	0.032	3/8	3/8	0.026	3/8	3/8	1/2	1/2	5/8	5/8	5/8	3/4	3/4	7/8
2	0.146	5/8	7/8	1 1/8	0.105	1	1 1/4	0.082	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	2	2 1/8	2 1/4	2 1/2	2 5/8
3	0.296	1 1/8	1 3/4	2 3/8	0.194	2	2 3/8	0.146	2	2 3/8	2 5/8	2 7/8	3 1/2	3 1/2	3 3/4	4 1/8	4 3/8	4 5/8
4	0.704	2 7/8	4 1/4	5 5/8	0.323	3 1/4	3 7/8	0.226	3 1/8	3 5/8	4 1/8	4 1/2	5	5 3/8	5 7/8	6 3/8	6 3/4	7 1/4
5	0.854	3 3/8	5 1/8	6 7/8	0.677	6 3/4	8 1/8	0.342	4 3/4	5 1/2	6 1/8	6 7/8	7 1/2	8 1/4	8 7/8	9 5/8	10 1/4	11
6	0.956	3 7/8	5 3/4	7 5/8	0.806	8	9 5/8	0.658	9 1/4	10 1/2	11 7/8	13 1/8	14 1/2	15 3/4	17 1/8	18 3/8	19 3/4	21
7					0.895	9	10 3/4	0.774	10 7/8	12 3/8	13 7/8	15 1/2	17	18 5/8	20 1/8	21 5/8	23 1/4	24 3/4
8					0.968	9 5/8	11 5/8	0.854	12	13 5/8	15 3/8	17 1/8	18 3/4	20 1/2	22 1/4	23 7/8	25 5/8	27 3/8
9								0.918	12 7/8	14 3/4	16 1/2	18 3/8	20 1/4	22	23 7/8	25 3/4	27 1/2	29 3/8
10								0.974	13 5/8	15 5/8	17 1/2	19 1/2	21 3/8	23 3/8	25 3/8	27 1/4	29 1/4	31 1/8

ROUND DUCT TRAVERSE REPORT

PROJECT: SMITH AQUATIC CENTER

SYSTEM/UNIT: GSHP-2A

LOCATION:

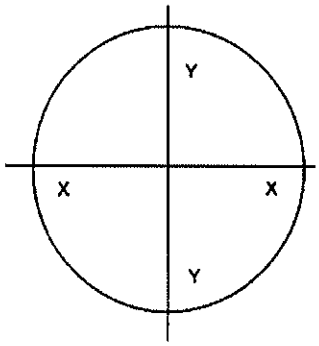
SERVICE: OA

DENSITY: STANDARD AIR

CORRECTION FACTOR:

DUCT				REQUIRED				ACTUAL			
S.P.:	0.029	AIR TEMP:		SCFM				SCFM			
SIZE:	10	AREA:	0.55 (sq.ft.)	FPM:	669	CFM:	365	FPM:	711	CFM:	387

PRELIMINARY			
POINT	DISTANCE	X - X FPM	Y - Y FPM
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
SUB TOTALS			
NO. OF POINTS			
AVE. VELOCITY			
CFM			



FINAL			
POINT	DISTANCE	X - X FPM	Y - Y FPM
1		675	653
2		701	710
3		712	759
4		741	739
5		713	723
6		701	774
7		670	766
8		661	747
9		701	760
10		622	693
SUB TOTALS		6897	7324
NO. OF POINTS		10	10
AVE. VELOCITY		690	732
CFM		387	

REMARKS:

CALCULATED PITOT TUBE TRAVERE POINTS

POINT	%	4	6	8	%	10	12	%	14	16	18	20	22	24	26	28	30	32
1	0.044	1/8	1/4	3/8	0.032	3/8	3/8	0.026	3/8	3/8	1/2	1/2	5/8	5/8	5/8	3/4	3/4	7/8
2	0.146	5/8	7/8	1 1/8	0.105	1	1 1/4	0.082	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	2	2 1/8	2 1/4	2 1/2	2 5/8
3	0.296	1 1/8	1 3/4	2 3/8	0.194	2	2 3/8	0.146	2	2 3/8	2 5/8	2 7/8	3 1/2	3 1/2	3 3/4	4 1/8	4 3/8	4 5/8
4	0.704	2 7/8	4 1/4	5 5/8	0.323	3 1/4	3 7/8	0.226	3 1/8	3 5/8	4 1/8	4 1/2	5	5 3/8	5 7/8	6 3/8	6 3/4	7 1/4
5	0.854	3 3/8	5 1/8	6 7/8	0.677	6 3/4	8 1/8	0.342	4 3/4	5 1/2	6 1/8	6 7/8	7 1/2	8 1/4	8 7/8	9 5/8	10 1/4	11
6	0.956	3 7/8	5 3/4	7 5/8	0.806	8	9 5/8	0.658	9 1/4	10 1/2	11 7/8	13 1/8	14 1/2	15 3/4	17 1/8	18 3/8	19 3/4	21
7					0.895	9	10 3/4	0.774	10 7/8	12 3/8	13 7/8	15 1/2	17	18 5/8	20 1/8	21 5/8	23 1/4	24 3/4
8					0.968	9 5/8	11 5/8	0.854	12	13 5/8	15 3/8	17 1/8	18 3/4	20 1/2	22 1/4	23 7/8	25 5/8	27 3/8
9								0.918	12 7/8	14 3/4	16 1/2	18 3/8	20 1/4	22	23 7/8	25 3/4	27 1/2	29 3/8
10								0.974	13 5/8	15 5/8	17 1/2	19 1/2	21 3/8	23 3/8	25 3/8	27 1/4	29 1/4	31 1/8

DATE: 8/26/10 - 10/20/10

READINGS BY: C. ST JOHN, C.ESTILL, J.POOL, M.BRIZENDINE & R.SEAMONS

ROUND DUCT TRAVERSE REPORT

PROJECT: SMITH AQUATIC CENTER

SYSTEM/UNIT: GSHP-2B

LOCATION:

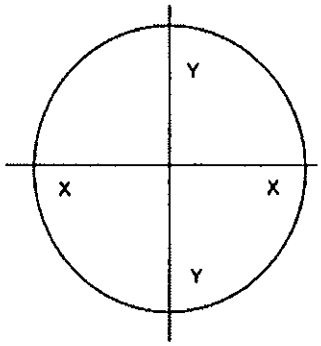
SERVICE: OA

DENSITY: STANDARD AIR

CORRECTION FACTOR:

DUCT				REQUIRED				ACTUAL			
S.P.:	0.015	AIR TEMP:		SCFM				SCFM			
SIZE:	14	AREA:	1.06 (sq.ft.)	FPM:	1028	CFM:	1090	FPM:	1094	CFM:	1159

PRELIMINARY			
POINT	DISTANCE	X - X FPM	Y - Y FPM
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
SUB TOTALS			
NO. OF POINTS			
AVE. VELOCITY			
CFM			



FINAL			
POINT	DISTANCE	X - X FPM	Y - Y FPM
1		1552	1485
2		1491	1488
3		1526	1387
4		1535	1323
5		1385	1212
6		173	535
7		819	685
8		1025	548
9		894	520
10		1036	555
SUB TOTALS		11436	9738
NO. OF POINTS		10	10
AVE. VELOCITY		1144	974
CFM		1159	

REMARKS:

CALCULATED PITOT TUBE TRAVERE POINTS

POINT	%	4	6	8	%	10	12	%	14	16	18	20	22	24	26	28	30	32
1	0.044	1/8	1/4	3/8	0.032	3/8	3/8	0.026	3/8	3/8	1/2	1/2	5/8	5/8	5/8	3/4	3/4	7/8
2	0.146	5/8	7/8	1 1/8	0.105	1	1 1/4	0.082	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	2	2 1/8	2 1/4	2 1/2	2 5/8
3	0.296	1 1/8	1 3/4	2 3/8	0.194	2	2 3/8	0.146	2	2 3/8	2 5/8	2 7/8	3 1/2	3 1/2	3 3/4	4 1/8	4 3/8	4 5/8
4	0.704	2 7/8	4 1/4	5 5/8	0.323	3 1/4	3 7/8	0.226	3 1/8	3 5/8	4 1/8	4 1/2	5	5 3/8	5 7/8	6 3/8	6 3/4	7 1/4
5	0.854	3 3/8	5 1/8	6 7/8	0.677	6 3/4	8 1/8	0.342	4 3/4	5 1/2	6 1/8	6 7/8	7 1/2	8 1/4	8 7/8	9 5/8	10 1/4	11
6	0.956	3 7/8	5 3/4	7 5/8	0.806	8	9 5/8	0.658	9 1/4	10 1/2	11 7/8	13 1/8	14 1/2	15 3/4	17 1/8	18 3/8	19 3/4	21
7					0.895	9	10 3/4	0.774	10 7/8	12 3/8	13 7/8	15 1/2	17	18 5/8	20 1/8	21 5/8	23 1/4	24 3/4
8					0.968	9 5/8	11 5/8	0.854	12	13 5/8	15 3/8	17 1/8	18 3/4	20 1/2	22 1/4	23 7/8	25 5/8	27 3/8
9								0.918	12 7/8	14 3/4	16 1/2	18 3/8	20 1/4	22	23 7/8	25 3/4	27 1/2	29 3/8
10								0.974	13 5/8	15 5/8	17 1/2	19 1/2	21 3/8	23 3/8	25 3/8	27 1/4	29 1/4	31 1/8

DATE: 8/26/10 - 10/20/10

READINGS BY: C. ST JOHN, C.ESTILL, J.POOL, M.BRIZENDINE & R.SEAMONS

ROUND DUCT TRAVERSE REPORT

PROJECT: SMITH AQUATIC CENTER

SYSTEM/UNIT: GSHP-2C

LOCATION:

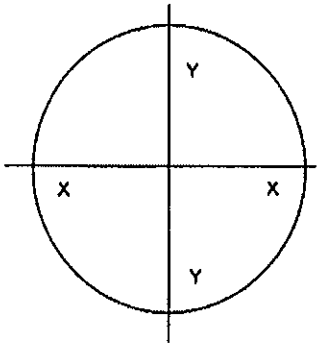
SERVICE: OA

DENSITY: STANDARD AIR

CORRECTION FACTOR:

DUCT				REQUIRED				ACTUAL			
S.P.:	0.088	AIR TEMP:		SCFM				SCFM			
SIZE:	10	AREA:	0.55 (sq.ft.)	FPM:	486	CFM:	265	FPM:	465	CFM:	253

PRELIMINARY			
POINT	DISTANCE	X - X FPM	Y - Y FPM
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
SUB TOTALS			
NO. OF POINTS			
AVE. VELOCITY			
CFM			



FINAL			
POINT	DISTANCE	X - X FPM	Y - Y FPM
1		434	774
2		509	670
3		384	605
4		338	534
5		350	484
6		547	456
7		487	435
8		460	389
9		477	338
10		394	255
SUB TOTALS		4380	4920
NO. OF POINTS		10	10
AVE. VELOCITY		438	492
CFM		253	

REMARKS:

CALCULATED PITOT TUBE TRAVERE POINTS

POINT	%	4	6	8	%	10	12	%	14	16	18	20	22	24	26	28	30	32
1	0.044	1/8	1/4	3/8	0.032	3/8	3/8	0.026	3/8	3/8	1/2	1/2	5/8	5/8	5/8	3/4	3/4	7/8
2	0.146	5/8	7/8	1 1/8	0.105	1	1 1/4	0.082	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	2	2 1/8	2 1/4	2 1/2	2 5/8
3	0.296	1 1/8	1 3/4	2 3/8	0.194	2	2 3/8	0.146	2	2 3/8	2 5/8	2 7/8	3 1/2	3 1/2	3 3/4	4 1/8	4 3/8	4 5/8
4	0.704	2 7/8	4 1/4	5 5/8	0.323	3 1/4	3 7/8	0.226	3 1/8	3 5/8	4 1/8	4 1/2	5	5 3/8	5 7/8	6 3/8	6 3/4	7 1/4
5	0.854	3 3/8	5 1/8	6 7/8	0.677	6 3/4	8 1/8	0.342	4 3/4	5 1/2	6 1/8	6 7/8	7 1/2	8 1/4	8 7/8	9 5/8	10 1/4	11
6	0.956	3 7/8	5 3/4	7 5/8	0.808	8	9 5/8	0.658	9 1/4	10 1/2	11 7/8	13 1/8	14 1/2	15 3/4	17 1/8	18 3/8	19 3/4	21
7					0.895	9	10 3/4	0.774	10 7/8	12 3/8	13 7/8	15 1/2	17	18 5/8	20 1/8	21 5/8	23 1/4	24 3/4
8					0.968	9 5/8	11 5/8	0.854	12	13 5/8	15 3/8	17 1/8	18 3/4	20 1/2	22 1/4	23 7/8	25 5/8	27 3/8
9								0.918	12 7/8	14 3/4	16 1/2	18 3/8	20 1/4	22	23 7/8	25 3/4	27 1/2	29 3/8
10								0.974	13 5/8	15 5/8	17 1/2	19 1/2	21 3/8	23 3/8	25 3/8	27 1/4	29 1/4	31 1/8

DATE: 8/26/10 - 10/20/10

READINGS BY: C. ST JOHN, C.ESTILL, J.POOL, M.BRIZENDINE & R.SEAMONS

ROUND DUCT TRAVERSE REPORT

PROJECT: SMITH AQUATIC CENTER

SYSTEM/UNIT: PDU-1

LOCATION:

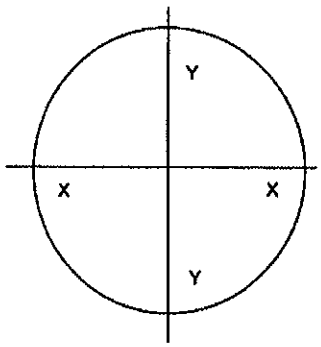
SERVICE: SUPPLY

DENSITY: STANDARD AIR

CORRECTION FACTOR:

DUCT				REQUIRED				ACTUAL			
S.P.:	0.216	AIR TEMP:		SCFM				SCFM			
SIZE:	36	AREA:	7.07 (sq.ft.)	FPM:	1130	CFM:	7990	FPM:	1243	CFM:	8786

PRELIMINARY			
POINT	DISTANCE	X - X FPM	Y - Y FPM
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
SUB TOTALS			
NO. OF POINTS			
AVE. VELOCITY			
CFM			



FINAL			
POINT	DISTANCE	X - X FPM	Y - Y FPM
1		1884	1119
2		1265	1121
3		1230	1191
4		1511	1435
5		1470	1431
6		968	1186
7		846	1203
8		0	1556
9		0	2073
10		794	2587
SUB TOTALS		9967	14902
NO. OF POINTS		10	10
AVE. VELOCITY		997	1490
CFM		8786	

REMARKS

CALCULATED PITOT TUBE TRAVERE POINTS

POINT	%	4	6	8	%	10	12	%	14	16	18	20	22	24	26	28	30	32
1	0.044	1/8	1/4	3/8	0.032	3/8	3/8	0.026	3/8	3/8	1/2	1/2	5/8	5/8	5/8	3/4	3/4	7/8
2	0.146	5/8	7/8	1 1/8	0.105	1	1 1/4	0.082	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	2	2 1/8	2 1/4	2 1/2	2 5/8
3	0.296	1 1/8	1 3/4	2 3/8	0.194	2	2 3/8	0.146	2	2 3/8	2 5/8	2 7/8	3 1/2	3 1/2	3 3/4	4 1/8	4 3/8	4 5/8
4	0.704	2 7/8	4 1/4	5 5/8	0.323	3 1/4	3 7/8	0.226	3 1/8	3 5/8	4 1/8	4 1/2	5	5 3/8	5 7/8	6 3/8	6 3/4	7 1/4
5	0.854	3 3/8	5 1/8	6 7/8	0.677	6 3/4	8 1/8	0.342	4 3/4	5 1/2	6 1/8	6 7/8	7 1/2	8 1/4	8 7/8	9 5/8	10 1/4	11
6	0.956	3 7/8	5 3/4	7 5/8	0.806	8	9 5/8	0.658	9 1/4	10 1/2	11 7/8	13 1/8	14 1/2	15 3/4	17 1/8	18 3/8	19 3/4	21
7					0.895	9	10 3/4	0.774	10 7/8	12 3/8	13 7/8	15 1/2	17	18 5/8	20 1/8	21 5/8	23 1/4	24 3/4
8					0.968	9 5/8	11 5/8	0.854	12	13 5/8	15 3/8	17 1/8	18 3/4	20 1/2	22 1/4	23 7/8	25 5/8	27 3/8
9								0.918	12 7/8	14 3/4	16 1/2	18 3/8	20 1/4	22	23 7/8	25 3/4	27 1/2	29 3/8
10								0.974	13 5/8	15 5/8	17 1/2	19 1/2	21 3/8	23 3/8	25 3/8	27 1/4	29 1/4	31 1/8

DATE: 8/26/10 - 10/20/10
REVISED:

READINGS BY: C. ST JOHN, C.ESTILL, J.POOL, M.BRIZENDINE & R.SEAMONS

ROUND DUCT TRAVERSE REPORT

PROJECT: SMITH AQUATIC CENTER

SYSTEM/UNIT: PDU-1

LOCATION:

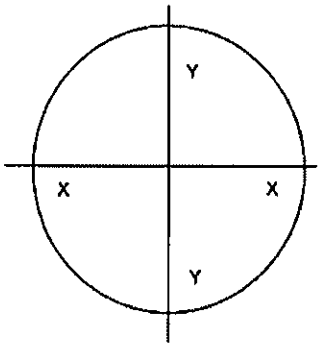
SERVICE: SUPPLY

DENSITY: STANDARD AIR

CORRECTION FACTOR:

DUCT				REQUIRED			ACTUAL			
S.P.: 0.435	AIR TEMP:			SCFM			SCFM			
SIZE: 36 "	AREA:	7.07	(sq.ft.)	FPM:	CFM:	7110	FPM:	1045	CFM:	7386

PRELIMINARY			
POINT	DISTANCE	X - X FPM	Y - Y FPM
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
SUB TOTALS			
NO. OF POINTS			
AVE. VELOCITY			
CFM			



FINAL			
POINT	DISTANCE	X - X FPM	Y - Y FPM
1		1081	2775
2		1223	476
3		1130	1861
4		1311	541
5		1535	1009
6		1633	0
7		1698	0
8		1504	0
9		2341	0
10		799	0
SUB TOTALS		14235	6662
NO. OF POINTS		10	10
AVE. VELOCITY		1424	666
CFM		7386	

REMARKS:

CALCULATED PITOT TUBE TRAVERE POINTS

POINT	%	4	6	8	%	10	12	%	14	16	18	20	22	24	26	28	30	32
1	0.044	1/8	1/4	3/8	0.032	3/8	3/8	0.026	3/8	3/8	1/2	1/2	5/8	5/8	5/8	3/4	3/4	7/8
2	0.146	5/8	7/8	1 1/8	0.105	1	1 1/4	0.082	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	2	2 1/8	2 1/4	2 1/2	2 5/8
3	0.296	1 1/8	1 3/4	2 3/8	0.194	2	2 3/8	0.146	2	2 3/8	2 5/8	2 7/8	3 1/2	3 1/2	3 3/4	4 1/8	4 3/8	4 5/8
4	0.704	2 7/8	4 1/4	5 5/8	0.323	3 1/4	3 7/8	0.226	3 1/8	3 5/8	4 1/8	4 1/2	5	5 3/8	5 7/8	6 3/8	6 3/4	7 1/4
5	0.854	3 3/8	5 1/8	6 7/8	0.677	6 3/4	8 1/8	0.342	4 3/4	5 1/2	6 1/8	6 7/8	7 1/2	8 1/4	8 7/8	9 5/8	10 1/4	11
6	0.956	3 7/8	5 3/4	7 5/8	0.806	8	9 5/8	0.658	9 1/4	10 1/2	11 7/8	13 1/8	14 1/2	15 3/4	17 1/8	18 3/8	19 3/4	21
7					0.895	9	10 3/4	0.774	10 7/8	12 3/8	13 7/8	15 1/2	17	18 5/8	20 1/8	21 5/8	23 1/4	24 3/4
8					0.968	9 5/8	11 5/8	0.854	12	13 5/8	15 3/8	17 1/8	18 3/4	20 1/2	22 1/4	23 7/8	25 5/8	27 3/8
9								0.918	12 7/8	14 3/4	16 1/2	18 3/8	20 1/4	22	23 7/8	25 3/4	27 1/2	29 3/8
10								0.974	13 5/8	15 5/8	17 1/2	19 1/2	21 3/8	23 3/8	25 3/8	27 1/4	29 1/4	31 1/8

DATE: 8/26/10 - 10/20/10
REVISED:

READINGS BY: C. ST JOHN, C.ESTILL, J.POOL, M.BRIZENDINE & R.SEAMONS

ROUND DUCT TRAVERSE REPORT

PROJECT: SMITH AQUATIC CENTER

LOCATION:

DENSITY: STANDARD AIR

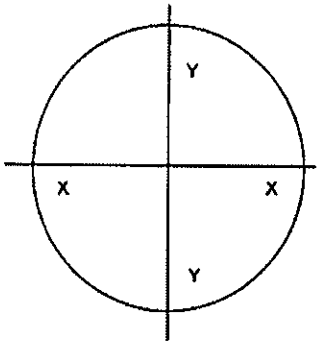
SYSTEM/UNIT: PDU-2

SERVICE: SUPPLY

CORRECTION FACTOR:

DUCT				REQUIRED				ACTUAL			
S.P.:	0.623	AIR TEMP:		SCFM				SCFM			
SIZE:	36	AREA:	7.07 (sq.ft.)	FPM:	803	CFM:	5680	FPM:	763	CFM:	5392

PRELIMINARY			
POINT	DISTANCE	X - X FPM	Y - Y FPM
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
SUB TOTALS			
NO. OF POINTS			
AVE. VELOCITY			
CFM			



FINAL			
POINT	DISTANCE	X - X FPM	Y - Y FPM
1		2323	0
2		1453	0
3		1729	0
4		2253	0
5		1630	0
6		0	0
7		0	0
8		0	2058
9		0	2682
10		0	1123
SUB TOTALS		9388	5863
NO. OF POINTS		10	10
AVE. VELOCITY		939	586
CFM		5392	

REMARKS

CALCULATED PITOT TUBE TRAVERE POINTS

POINT	%	4	6	8	%	10	12	%	14	16	18	20	22	24	26	28	30	32
1	0.044	1/8	1/4	3/8	0.032	3/8	3/8	0.026	3/8	3/8	1/2	1/2	5/8	5/8	5/8	3/4	3/4	7/8
2	0.146	5/8	7/8	1 1/8	0.105	1	1 1/4	0.082	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	2	2 1/8	2 1/4	2 1/2	2 5/8
3	0.296	1 1/8	1 3/4	2 3/8	0.194	2	2 3/8	0.146	2	2 3/8	2 5/8	2 7/8	3 1/2	3 1/2	3 3/4	4 1/8	4 3/8	4 5/8
4	0.704	2 7/8	4 1/4	5 5/8	0.323	3 1/4	3 7/8	0.226	3 1/8	3 5/8	4 1/8	4 1/2	5	5 3/8	5 7/8	6 3/8	6 3/4	7 1/4
5	0.854	3 3/8	5 1/8	6 7/8	0.677	6 3/4	8 1/8	0.342	4 3/4	5 1/2	6 1/8	6 7/8	7 1/2	8 1/4	8 7/8	9 5/8	10 1/4	11
6	0.956	3 7/8	5 3/4	7 5/8	0.806	8	9 5/8	0.658	9 1/4	10 1/2	11 7/8	13 1/8	14 1/2	15 3/4	17 1/8	18 3/8	19 3/4	21
7					0.896	9	10 3/4	0.774	10 7/8	12 3/8	13 7/8	15 1/2	17	18 5/8	20 1/8	21 5/8	23 1/4	24 3/4
8					0.968	9 5/8	11 5/8	0.854	12	13 5/8	15 3/8	17 1/8	18 3/4	20 1/2	22 1/4	23 7/8	25 5/8	27 3/8
9								0.918	12 7/8	14 3/4	16 1/2	18 3/8	20 1/4	22	23 7/8	25 3/4	27 1/2	29 3/8
10								0.974	13 5/8	15 5/8	17 1/2	19 1/2	21 3/8	23 3/8	25 3/8	27 1/4	29 1/4	31 1/8

DATE: 8/26/10 - 10/20/10
REVISED:

READINGS BY: C. ST JOHN, C.ESTILL, J.POOL, M.BRIZENDINE & R.SEAMONS

ROUND DUCT TRAVERSE REPORT

PROJECT: SMITH AQUATIC CENTER

SYSTEM/UNIT: PDU-2

LOCATION:

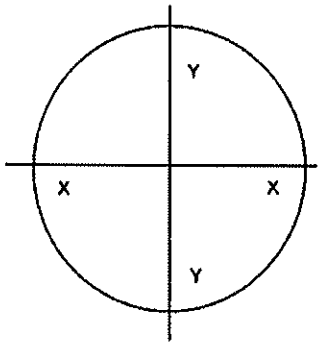
SERVICE: SUPPLY

DENSITY: STANDARD AIR

CORRECTION FACTOR:

DUCT				REQUIRED				ACTUAL			
S.P.:	0.137	AIR TEMP:		SCFM				SCFM			
SIZE:	36	AREA:	7.07 (sq.ft.)	FPM:	983	CFM:	6945	FPM:	952	CFM:	6728

PRELIMINARY			
POINT	DISTANCE	X - X FPM	Y - Y FPM
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
SUB TOTALS			
NO. OF POINTS			
AVE. VELOCITY			
CFM			



FINAL			
POINT	DISTANCE	X - X FPM	Y - Y FPM
1		1807	2668
2		1411	2350
3		1398	2248
4		1344	1397
5		1343	653
6		573	998
7		389	401
8		268	0
9		0	0
10		0	0
SUB TOTALS		8333	10713
NO. OF POINTS		10	10
AVE. VELOCITY		833	1071
CFM		6728	

REMARKS

CALCULATED PITOT TUBE TRAVERE POINTS

POINT	%	4	6	8	%	10	12	%	14	16	18	20	22	24	26	28	30	32
1	0.044	1/8	1/4	3/8	0.032	3/8	3/8	0.026	3/8	3/8	1/2	1/2	5/8	5/8	5/8	3/4	3/4	7/8
2	0.146	5/8	7/8	1 1/8	0.105	1	1 1/4	0.082	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	2	2 1/8	2 1/4	2 1/2	2 5/8
3	0.296	1 1/8	1 3/4	2 3/8	0.194	2	2 3/8	0.146	2	2 3/8	2 5/8	2 7/8	3 1/2	3 1/2	3 3/4	4 1/8	4 3/8	4 5/8
4	0.704	2 7/8	4 1/4	5 5/8	0.323	3 1/4	3 7/8	0.226	3 1/8	3 5/8	4 1/8	4 1/2	5	5 3/8	5 7/8	6 3/8	6 3/4	7 1/4
5	0.854	3 3/8	5 1/8	6 7/8	0.677	6 3/4	8 1/8	0.342	4 3/4	5 1/2	6 1/8	6 7/8	7 1/2	8 1/4	8 7/8	9 5/8	10 1/4	11
6	0.956	3 7/8	5 3/4	7 5/8	0.806	8	9 5/8	0.658	9 1/4	10 1/2	11 7/8	13 1/8	14 1/2	15 3/4	17 1/8	18 3/8	19 3/4	21
7					0.895	9	10 3/4	0.774	10 7/8	12 3/8	13 7/8	15 1/2	17	18 5/8	20 1/8	21 5/8	23 1/4	24 3/4
8					0.968	9 5/8	11 5/8	0.854	12	13 5/8	15 3/8	17 1/8	18 3/4	20 1/2	22 1/4	23 7/8	25 5/8	27 3/8
9								0.918	12 7/8	14 3/4	16 1/2	18 3/8	20 1/4	22	23 7/8	25 3/4	27 1/2	29 3/8
10								0.974	13 5/8	15 5/8	17 1/2	19 1/2	21 3/8	23 3/8	25 3/8	27 1/4	29 1/4	31 1/8

DATE: 8/26/10 - 10/20/10
REVISED:

READINGS BY: C. ST JOHN, C.ESTILL, J.POOL, M.BRIZENDINE & R.SEAMONS

VELGRID
TEST REPORT

PROJECT: SMITH AQUATIC CENTER

SYSTEM/UNIT: PDU-1

LOCATION:

SERVICE: SUPPLY

ALTITUDE:

DENSITY: STANDARD AIR

CORRECTION FACTOR:

INSTRUMENT USED	REQUIRED	ACTUAL
SHORTRIDGE INSTRUMENTS VELGRID	FPM: 1006 CFM: 15100	FPM: 1105 CFM: 16575

TEST SIZE: 30 X 72

TEST AREA: 15

	POSITION	1	2	3	4	5	6	7	8	9	10	11	12	
	1	1116	1018	961	1117	1084	1190							
	2	1187	1165	1040	1075	1113	1188							
	3													
	4													
	5													
	6													
	7													
	8													
	9													
	10													
	11													
	12													
DISTANCE FROM DUCT EDGE														
VELOCITY SUB-TOTALS														

REMARKS:

TEST DATE: 8/26/10 - 10/20/10

READINGS BY: C. ST JOHN, C.ESTILL, J.POOL
M.BRIZENDINE & R.SEAMONS

VELGRID
TEST REPORT

PROJECT: SMITH AQUATIC CENTER

SYSTEM/UNIT: PDU-2

LOCATION:

SERVICE: SUPPLY

ALTITUDE:

DENSITY: STANDARD AIR

CORRECTION FACTOR:

INSTRUMENT USED	REQUIRED	ACTUAL
SHORTRIDGE INSTRUMENTS VELGRID	FPM: 1006 CFM: 15100	FPM: 1085 CFM: 16275

TEST SIZE: 30 X 72

TEST AREA: 15

	POSITION	1	2	3	4	5	6	7	8	9	10	11	12	
	1	1110	1014	971	1096	1039	1104							
	2	1136	1086	1025	1115	1195	1123							
	3													
	4													
	5													
	6													
	7													
	8													
	9													
	10													
	11													
	12													
DISTANCE FROM DUCT EDGE														
VELOCITY SUB-TOTALS														

REMARKS:

BALANCE VALVE/FLOW METER TEST REPORT

PROJECT: SMITH AQUATIC CENTER

SYSTEM: HEAT PUMP LOOP

SERVICE OR DESIGNATION	SIZE (IN.)	MODEL	VENTRI SIZE	DESIGN GPM	ACTUAL VALVE SETPOINT	ACTUAL VALVE P.D. (PSI)	ACTUAL GPM	NOTES
GSWP-1	1 1/2	HAYES 2535	X	65	X	6.75	65	
GSWP-2	1 1/2	HAYES 2535	X	65	X	5.35	65	
GSHP-1A	1	HAYES 2520	X	12	X	3.19	12	
GSHP-1B	3/4	HAYES 2510	X	6	X	7.94	6	
GSHP-1C	1	HAYES 2510	X	4	X	2.1	4	
GSHP-2A	1 1/4	HAYES 2520	X	21	X	3.73	21	
GSHP-2B	1 1/4	HAYES 2520	X	21	X	3.14	21	
GSHP-2C	3/4	HAYES 2510	X	6	X	5.73	6	
GSHP-2D	1	HAYES 2520	X	14	X	2.44	14	
PDU-1A	2	HAYES 2550	X	30	X	15.3	30	
PDU-1B	2	HAYES 2550	X	40	X	3.2	40	
PDU-2A	2	HAYES 2550	X	30	X	8.8	30	
PDU-2B	2	HAYES 2550	X	40	X	2.8	40	
SEPARATE								
CIRCUITS								
PDU-1 POOL	2	HAYES 2550	X	30	X	10.4	30	
PDU-2 POOL	2	HAYES 2550	X	30	X	15.2	30	
GSWP-1 HW COIL	1 1/2	HAYES 2535	X	60	X	2.1	60	
HSWP-1 HW COIL	1 1/2	HAYES 2535	X	60	X	2.3	60	

REMARKS:

THE VALVES SHOWN ABOVE ARE AUTOMATIC BALANCE VALVES WITH A SPRING RANGE OF 2-80 PSI.

TEST DATE: 8/26/10 - 10/20/10

READINGS BY: C. ST JOHN, C.ESTILL, J.POOL, M.BRIZENDINE & R.SEAMONS

BALANCE VALVE/FLOW METER TEST REPORT

PROJECT: SMITH AQUATIC CENTER

LOCATION:

SYSTEM: WELL SYSTEM
GROUND WATER SYSTEM
NON-BLEED OPERATION

SERVICE OR DESIGNATION	SIZE (IN.)	MODEL	DESIGN GPM	ACTUAL VALVE SETPOINT	ACTUAL VALVE P.D. (FT.)	ACTUAL GPM	NOTES
SUPPLIES							
WELL #1	3	X	66	X	X	60.9	
WELL #2	3	X	66	X	X	61.7	
WELL #3	3	X	66	X	X	64.4	
WELL #4	3	X	66	X	X	69.9	
WELL #5	3	X	66	X	X	60.9	
RETURNS							
WELL #1	3	X	66	X	X	62.3	
WELL#2	3	X	66	X	X	64.6	
WELL#3	3	X	66	X	X	69.6	
WELL#4	3	X	66	X	X	66.2	
WELL#5	3	X	66	X	X	60.9	

307.9 GPM Supply Total
273.3 GPM Return Total
-34.6 GPM Total difference

SCW Supply - Return
GPM SCW 1 (19 GPM DD R1)
GPM SCW 2 (7 GPM DD R1)
GPM SCW 3 (1 GPM DD R1)
GPM SCW 4 (2 GPM DD R1)
GPM SCW 5 (6 GPM DD R1)

REMARKS:

ALL FLOW SENSORS CALIBRATED. (11) 5 SUPPLY, 5 RETURNS, 1 PURGE.

*THESE CIRCUITS WERE SET-UP USING AN EESI ULTRASONIC FLOW METER.

TEST DATE: 6/9/11
REVISED 1/3/12

READINGS BY: D. POOL & R. BURTON

BALANCE VALVE/FLOW METER TEST REPORT

PROJECT: SMITH AQUATIC CENTER

SYSTEM: WELL SYSTEM
GROUND WATER SYSTEM
BLEED OPERATION

LOCATION:

SERVICE OR DESIGNATION	SIZE (IN.)	MODEL	DESIGN GPM	ACTUAL VALVE SETPOINT	ACTUAL VALVE P.D. (FT.)	ACTUAL GPM	NOTES
SUPPLY							
WELL #1	3	X	66	X	X	60.1	
WELL #2	3	X	66	X	X	59.4	
WELL #3	3	X	66	X	X	60.5	
WELL #4	3	X	66	X	X	65.9	
WELL #5	3	X	66	X	X	62	
							BLEED
RETURN							RATE**
WELL#1	3	X	47	X	X	40.2	19.9**
WELL#2	3	X	64	X	X	57.4	2**
WELL#3	3	X	65	X	X	58.9	1.6**
WELL#4	3	X	59	X	X	59.5	6.4**
WELL#5	3	X	60	X	X	57.3	4.7**
BLEED PUMP	1 1/2	B&G	35	24	27.4	34	

307.9 GPM Supply Total
273.3 GPM Return Total
-34.6 GPM Total difference

SCW Supply - Return
GPM SCW 1 (19 GPM DD R1)
GPM SCW 2 (7 GPM DD R1)
GPM SCW 3 (1 GPM DD R1)
GPM SCW 4 (2 GPM DD R1)
GPM SCW 5 (6 GPM DD R1)

REMARKS:

ALL FLOW SENSORS CALIBRATED. (11) 5 SUPPLY, 5 RETURNS, 1 BLEED

*THESE CIRCUITS WERE SET-UP USING AN EESI ULTRASONIC FLOW METER.

**CALCULATED BLEED RATES DETERMINED BY SUBTRACTING RETURN FLOW RATE FROM SUPPLY FLOW RATE.

DESIGN BLEED RATES ARE: WELL #1 = 19, #2 = 2, #3 = 1, #4 = 7, #5 = 6 GPM

TEST DATE: 6/9/11
REVISED 1/3/12

READINGS BY: D. POOL & R. BURTON

PUMP TEST REPORT

PROJECT: SMITH AQUATIC CENTER

DESIGN DATA	PUMP NO. LPP-1	PUMP NO. FPP-1	PUMP NO. PDP-1	PUMP NO. PDP-2
LOCATION	PUMP RM	PUMP RM	PUMP RM	PUMP RM
SERVICE	LAP POOL	FAMILY POOL	PDU-1	PDU-2
MANUFACTURER	ARMSTRONG	ARMSTRONG	ARMSTRONG	ARMSTRONG
MODEL NUMBER	L281050AB	LS45AB	65D060001	65D060001
SERIAL NUMBER	210	NG	484362	484362
GPM / FEET OF HEAD	55/10	90/15	30/29	30/29
REQUIRED NPSH (ft.)	X	X	X	X
PUMP RPM	1800	1800	1800	1800
IMPELLER DIAMETER (In.)	4.75		5.57	5.57
MOTOR MFR / FRAME	BALDOR / 56C	BALDOR / 56C	ARMSTRONG / 56C	ARMSTRONG/ 56C
MOTOR HP / RPM	1/2 / 1725	1/4 / 1725	3/4 / 1725	3/4 / 1725
VOLTS/PHASE/HERTZ	115 / 1 /60	115 / 1 / 60	208 / 3 / 60	208 / 3 / 60
F.L.A. / SER. FACTOR	7.4 / 1.25	5 / 1.35	2.7 / 1.5	2.7 / 1.5
SEAL TYPE	STANDARD	STANDARD	STANDARD	STANDARD
ACTUAL DATA				
PUMP OFF PRESS. (ft)	61.2	*	**	**
VALVE SHUT DIFF. (ft)	21.3	*	**	**
ACT. IMPELLER DIA. (in)	4.75	*	**	**
VALVE OPEN DIFF. (ft)	11.2	*	**	**
VALVE OPEN GPM	50	*	**	**
FINAL DISCHG.PRESS (ft)	73.4	*	**	**
FINAL SUCT. PRESS. (ft)	62.2	*	**	**
FINAL DELTA P (ft)	11.2	*	**	**
FINAL GPM	50	*	**	**
VOLT.T1-T2/T2-T3/T3-T1	123.7	124.8	214/215/215	215/215/215
AMPS. T1 T2 T3	7.2	4.7	1.8/1.6/1.7	1.6/1.7/1.5

REMARKS:

*- THERE ARE NO PORTS (TAPS) ON THE PUMP HOUSING TO ALLOW PUMP PRESSURES TO BE OBTAINED.

**- NO PORT TO READ THIS PUMP HOWEVER IT SERVES A PDU WHICH HAS A HAYS AUTOMATIC BALANCE VALVE THAT IS RATED FOR 30 GPM. THE PRESSURE ACROSS THE VALVE IS 3.4 PSI FOR PDU-1 AND 3.7 PSI FOR PDU-2.

TEST DATE: 8/26/10 - 10/20/10

READINGS BY: C.ST JOHN, C.ESTILL, J.POOL M.BRIZENDINE & R.SEAMONS

PUMP TEST REPORT

PROJECT: SMITH AQUATIC CENTER

DESIGN DATA	PUMP NO. WP-1	PUMP NO. PURGE PUMP	PUMP NO.	PUMP NO.
LOCATION	MECH RM	BASEMENT MECH		
SERVICE	PDU-1&2 ~ GSHP 1&2	PURGE PUMP		
MANUFACTURER	ARMSTRONG	B&G		
MODEL NUMBER	301060002	60 1.5 X 7		
SERIAL NUMBER	484362	C112050-01 HO1		
GPM / FEET OF HEAD	120/14	35 / 45		
REQUIRED NPSH (ft.)	X	X		
PUMP RPM	1800	1800		
IMPELLER DIAMETER (in.)	5	6.5 AB		
MOTOR MFR / FRAME	ARMSTRONG / 56C	B&G / 56CZ-85		
MOTOR HP / RPM	1 / 1725	1 1/2 / 1725		
VOLTS/PHASE/HERTZ	208 / 3 / 60	208 / 1 / 60		
F.L.A. / SER. FACTOR	3.5 / 1.15	9.3 / 1.15		
SEAL TYPE	STANDARD	STANDARD		
ACTUAL DATA				
PUMP OFF PRESS. (ft)	34.8	*		
VALVE SHUT DIFF. (ft)	23.4	*		
ACT. IMPELLER DIA. (in)	5	*		
VALVE OPEN DIFF. (ft)	17.2	*		
VALVE OPEN GPM	115	*		
FINAL DISCHG.PRESS (ft)	50.8	*		
FINAL SUCT. PRESS. (ft)	33.6	*		
FINAL DELTA P (ft)	17.2	*		
FINAL GPM	115	34*		
VOLT.T1-T2/T2-T3/T3-T1	209 / 210 / 211	209		
AMPS. T1 T2 T3	2.7 / 3 / 2.9	8.4		

REMARKS:

*FLOW WAS SET USING THE B & G BALANCE VALVE ON THE DISCHARGE SIDE OF THE PUMP. THE VALVE IS SET AT 30 AND HAS A DELTA P. OF 37.4 EQUALLING 34 GPM.

BOILER TEST REPORT

PROJECT: SMITH AQUATIC CENTER

UNIT DATA	UNIT NO. B-1		UNIT NO. B-2		UNIT NO	
LOCATION	BOILER 112		BOILER 112			
MANUFACTURER	LOCHINVAR		LOCHINVAR			
MODEL NUMBER	CPN0991		CPN751			
SERIAL NUMBER	C1H00224946		C1OH00224921			
TYPE / SIZE	HW		HW			
FUEL / INPUT	LP/990MBH		LP/750MBH			
NO. OF PASSES	1		1			
IGNITION TYPE	H S I		H S I			
BURNER CONTROL	NEPTRONIC		NEPTRONIC			
VOLTS / PHASE / HERTZ	115/1/60		115/1/60			
TEST DATA	**DESIGN**	**ACTUAL**	**DESIGN**	**ACTUAL**	**DESIGN**	**ACTUAL**
WORKING PRESS. / TEMP.	X	68'/180	X	68'/180		
ENT. / LVG. TEMP.	160/180	151/174	160/180	153/178		
NO. SAFETY VALVES / SIZE	X	1 / 3/4"	X	1 / 3/4"		
SAFETY VALVE SETTING	X	150PSI	X	150PSI		
HIGH LIMIT SETTING	X	210	X	210		
OPERATING CONT. SETTING	x	180	X	180		
HIGH FIRE SETPOINT	X	X	X	X		
LOW FIRE SETTING	X	X	X	X		
VOLTAGE T1-T2 T2-T3 T3-T1	115	116	115	117		
AMPERAGE T1 T2 T3	7.4	2.8	5	2.4		
DRAFT FAN VOLTS / AMPS	X	X	X	X		
MANIFOLD PRESS.	X	X	X	X		
OUTPUT MBH	X	X	X	X		
SAFETY CONTROLS-CHECK	X	OK	X	OK		

REMARKS:

TEST DATE: 11/11/2010

READINGS BY: D. POOL

INSTRUMENT CALIBRATION REPORT

PROJECT: SMITH AQUATIC CENTER

INSTRUMENT/SERIAL NO.	APPLICATION	CALIBRATION DATE
SHORTRIDGE ADM-870 / M01728	AIR - VEL., PRES., VOL.	10/29/2011
SHIMIPO LASER TACH DT-205LR / C1110065R	ROTATIONAL SPEEDS	3/30/2011
SHORTRIDGE HDM-250 DIFFERENTIAL METER / SN: W11139	WATER DIFFERENTIAL PRESS.	8/19/2011
FLUKE 902 TRUE RMS CLAMP METER / 16140180	VOLTS/AMPS	5/09/2011

REMARKS:

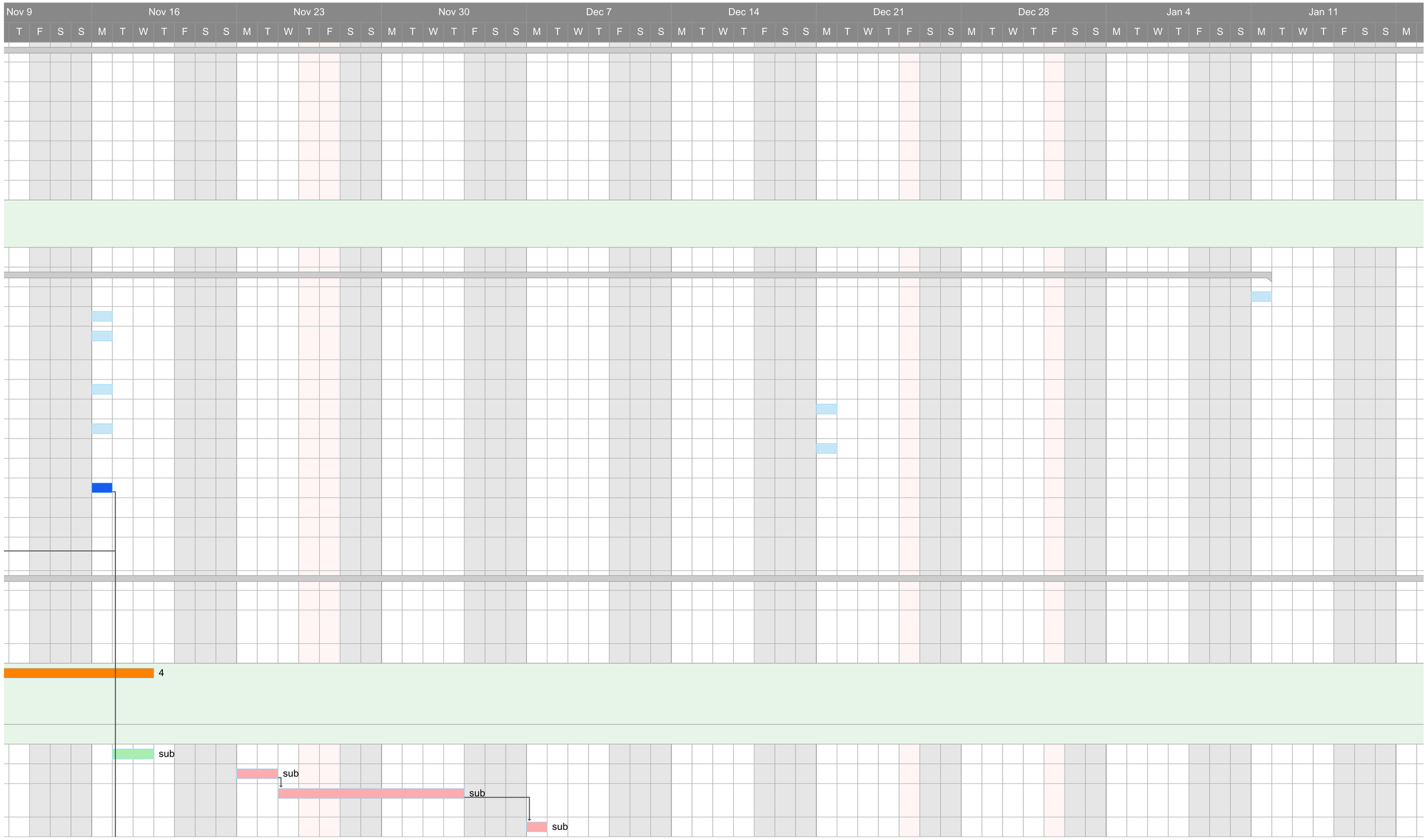
Job Schedule

ATTACHMENT B

smartsheet

	Task Name	Hours	Duration	Manpower	Start	Finish	% Complete	Predecessors	Comments
1	**Smith Aquatics**		133d		09/09/20	04/30/21	3%		
2	**Preconstruction**		26d		09/09/20	10/22/20	30%		
3	Scans for CAD		2d		10/21/20	10/22/20	10%		
4	building permits		1d		09/09/20	09/09/20	100%		
5	Trade permits		1d		09/25/20	09/25/20	100%		
6	Utilities marking		5d		10/05/20	10/12/20			
7	Site Mobilization		5d		09/14/20	09/21/20	100%		
8	Submittals		20d		09/14/20	10/15/20	30%		
9	Investigate, shut down and drain existing systems as required		10d	4	09/16/20	10/01/20			
10	Lock Out Tag Out		?		09/28/20	09/23/20			
11	**Delivery Dates**		40d		11/02/20	01/11/21			Delivery dates are not final, we will update these as we get actual delivery dates.
12	Pool Units		1d		01/11/21	01/11/21			16 week lead time
13	ERV		1d		11/16/20	11/16/20			6 week lead time
14	Water Sourced Heat Pumps		1d		11/16/20	11/16/20			6 week lead time
15	Fans		1d		11/02/20	11/02/20			
16	Pumps		1d		11/16/20	11/16/20			4-6 week
17	Boilers		1d		12/21/20	12/21/20			8-12 week
18	Heat exchanger		1d		11/16/20	11/16/20			4-6 week
19	Cooling Tower		1d		12/21/20	12/21/20			8-12 week
20	Piping Prefab Delivery		1d		11/09/20	11/09/20			
21	HVAC Duct Delivery		1d		11/16/20	11/16/20			
22									
23	**- CAD DRAWINGS**		15d		10/05/20	10/28/20			
24	Mech room coordination drawings		15d		10/05/20	10/28/20			
25	**Exterior work**		116d		09/17/20	04/08/21	3%		
26	Tree removal		2d	sub	09/17/20	09/21/20	100%		
27	Lay out and demo of side walk		8d	sub	10/12/20	10/22/20			
28	excavation for UG pipe		7d	sub	10/26/20	11/04/20	0%	27	
29	UG Condenser Water Pipe, Makeup Water, Chemical Feed line Install		8d	4	11/05/20	11/18/20		28	
30	Heat trace		2d	2	01/20/21	01/21/21			
31	Controls conduit install		2d	sub	11/17/20	11/18/20			
32	Back fill trenches		2d	sub	11/23/20	11/24/20			
33	Excavate and form tower pad		5d	sub	11/25/20	12/03/20		32	
34	pour tower pad		1d	sub	12/07/20	12/07/20		33	

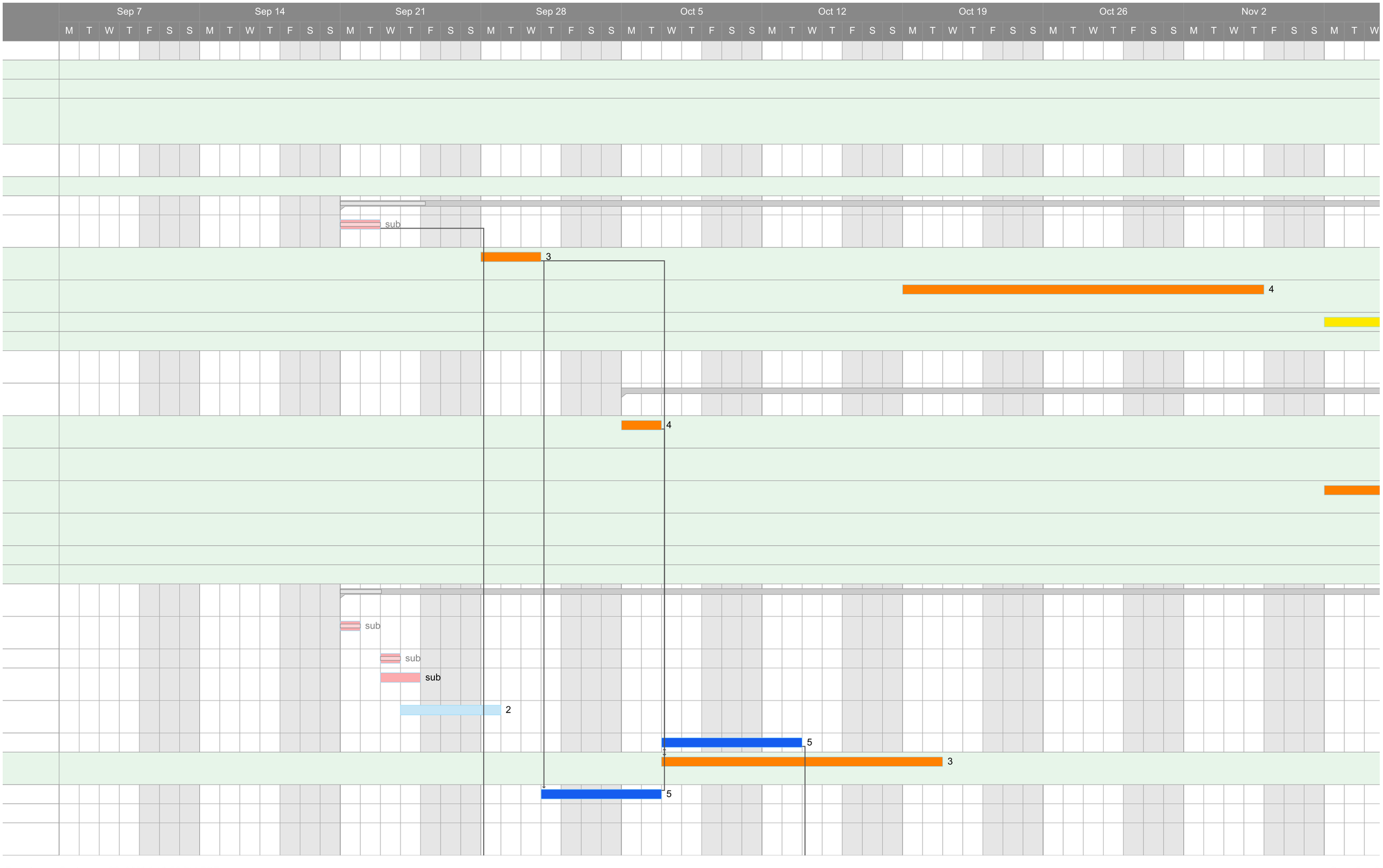
Sep 7
Sep 14
Sep 21
Sep 28
Oct 5
Oct 12
Oct 19
Oct 26
Nov 2
M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W
4
sub
sub
sub

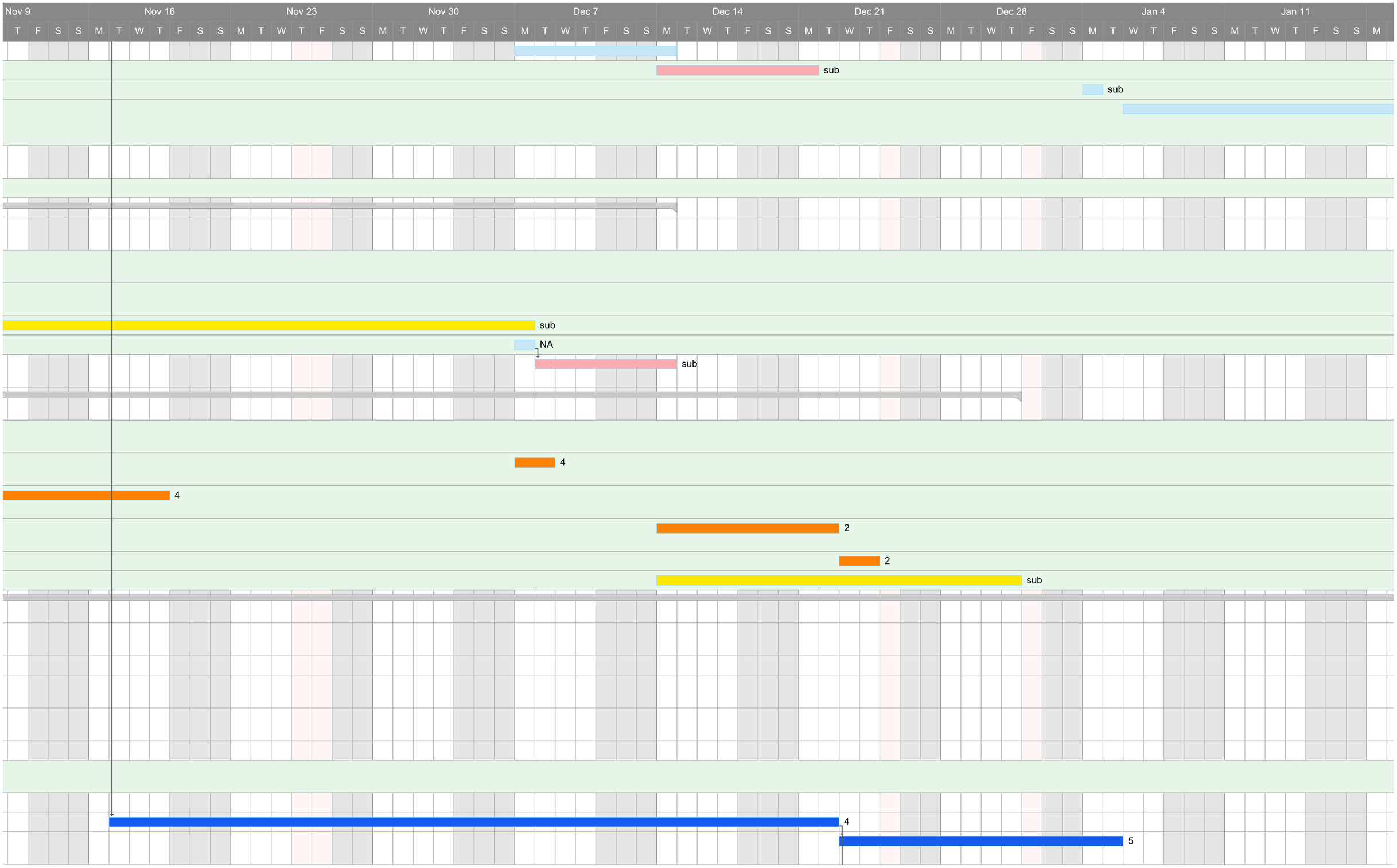

Nov 9
Nov 16
Nov 23
Nov 30
Dec 7
Dec 14
Dec 21
Dec 28
Jan 4
Jan 11
T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M
4
sub
sub
sub
sub

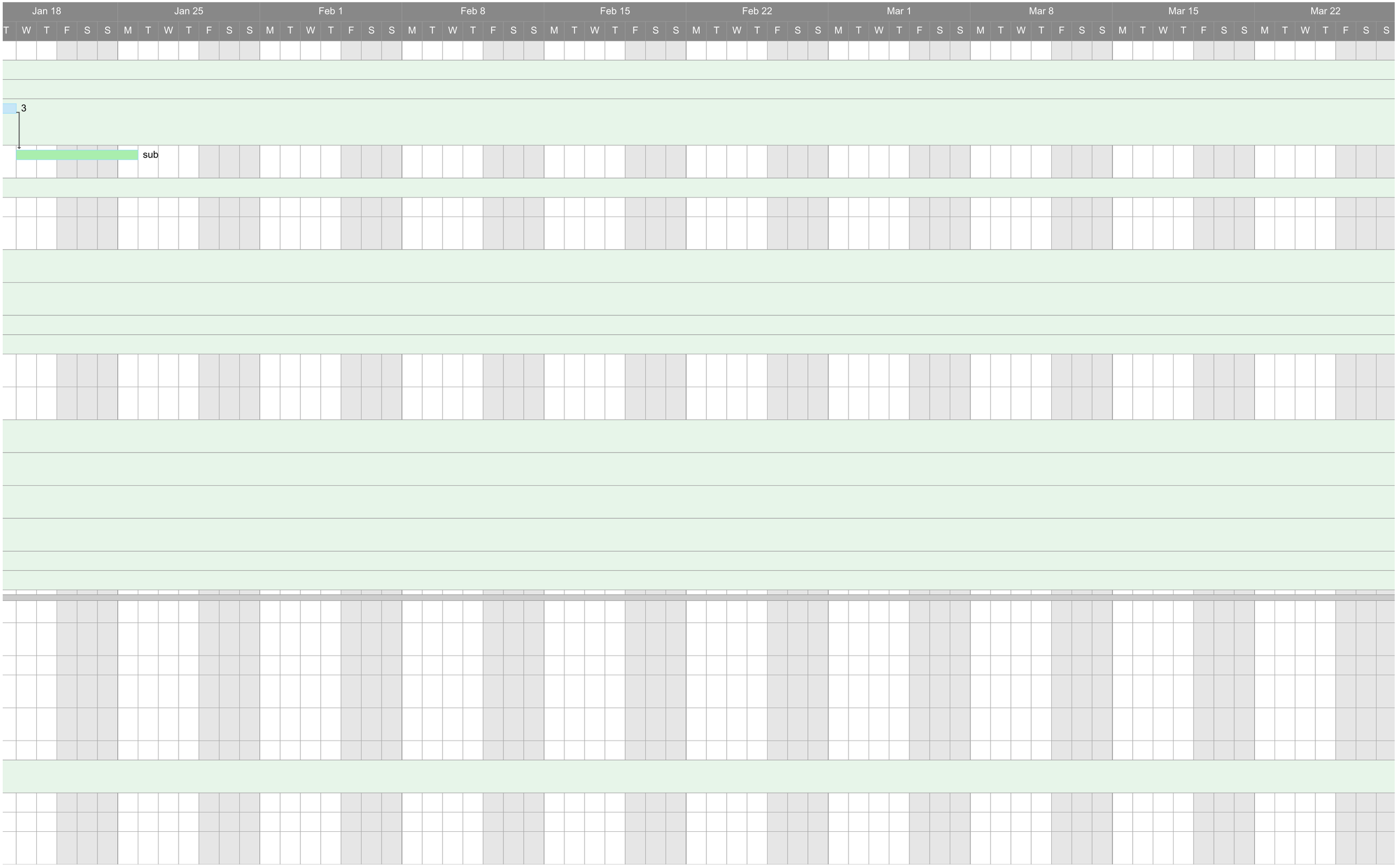
Jan 18
Jan 25
Feb 1
Feb 8
Feb 15
Feb 22
Mar 1
Mar 8
Mar 15
Mar 22
T W T F S S
M T W T F S S
2

Mar 29							Apr 5							Apr 12							Apr 19							Apr 26						
M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S

	Task Name	Hours	Duration	Manpower	Start	Finish	% Complete	Predecessors	Comments
35	Third party testing		5d		12/07/20	12/14/20			
36	Steel delivery & Install		5d	sub	12/14/20	12/21/20			
37	Set the Cooling tower		1d	sub	01/04/21	01/04/21			
38	Assemble Cooling Tower / Equipment connections		8d	3	01/06/21	01/19/21			
39	Cooling tower controls install		3d	sub	01/20/21	01/25/21		38	
40	land scape/seeding		4d	sub	04/05/21	04/08/21			
41	**1st Floor**		48d		09/21/20	12/14/20	5%		
42	Ceiling Tile & Grid Removal / Storage		2d	sub	09/21/20	09/22/20	100%		
43	Cap Well's & Demo Existing CDW Piping		3d	3	09/28/20	09/30/20			
44	Piping R/I New CDW & Makeup Water		12d	4	10/19/20	11/05/20			
45	Piping SUB Insulation		16d	sub	11/09/20	12/07/20			
46	Overhead Inspection		1d	NA	12/07/20	12/07/20			
47	Reinstall Grid & Ceiling Tiles		4d	sub	12/08/20	12/14/20		46	
48	**Mechanical room 112 & Boiler Yard**		51d		10/05/20	12/31/20			
49	Demo Existing Boiler, piping, vents & pumps		2d	4	10/05/20	10/06/20			
50	Overhead PDP Pump Changeout		2d	4	12/07/20	12/08/20			Need to check Lead-time on Pump's
51	Piping R/I for new Boiler-1		8d	4	11/09/20	11/19/20			
52	Set New Boiler-1 & Equip Connections		6d	2	12/14/20	12/22/20			Need to Check Lead-time on Boiler's
53	Piping Trim Out		2d	2	12/23/20	12/24/20			
54	Piping SUB Insulation		12d	sub	12/14/20	12/31/20			
55	**Second Floor mechanical room 210**		118d		09/21/20	04/14/21	1%		
56	Floor protection installed		1d	sub	09/21/20	09/21/20	100%		
57	Removal of window		1d	sub	09/23/20	09/23/20	100%		
58	Make window opening secure and water tight		2d	sub	09/23/20	09/24/20			
59	Make equipment safe for demo electrical		2d	2	09/24/20	09/28/20			
60	Demo HVAC Equipment		4d	5	10/07/20	10/13/20		62	
61	Demo Existing Piping to be removed		8d	3	10/07/20	10/20/20		49, 43	
62	Demo Duct		3d	5	10/01/20	10/06/20		43	
63	HVAC R/I		20d	4	11/17/20	12/22/20		24, 21	
64	HVAC Equipment tie ins heat pumps		8d	5	12/23/20	01/05/21		63	


Sep 7
Sep 14
Sep 21
Sep 28
Oct 5
Oct 12
Oct 19
Oct 26
Nov 2
M T W T F S S
sub
3
4
4
sub
sub
sub
2
5
3
5

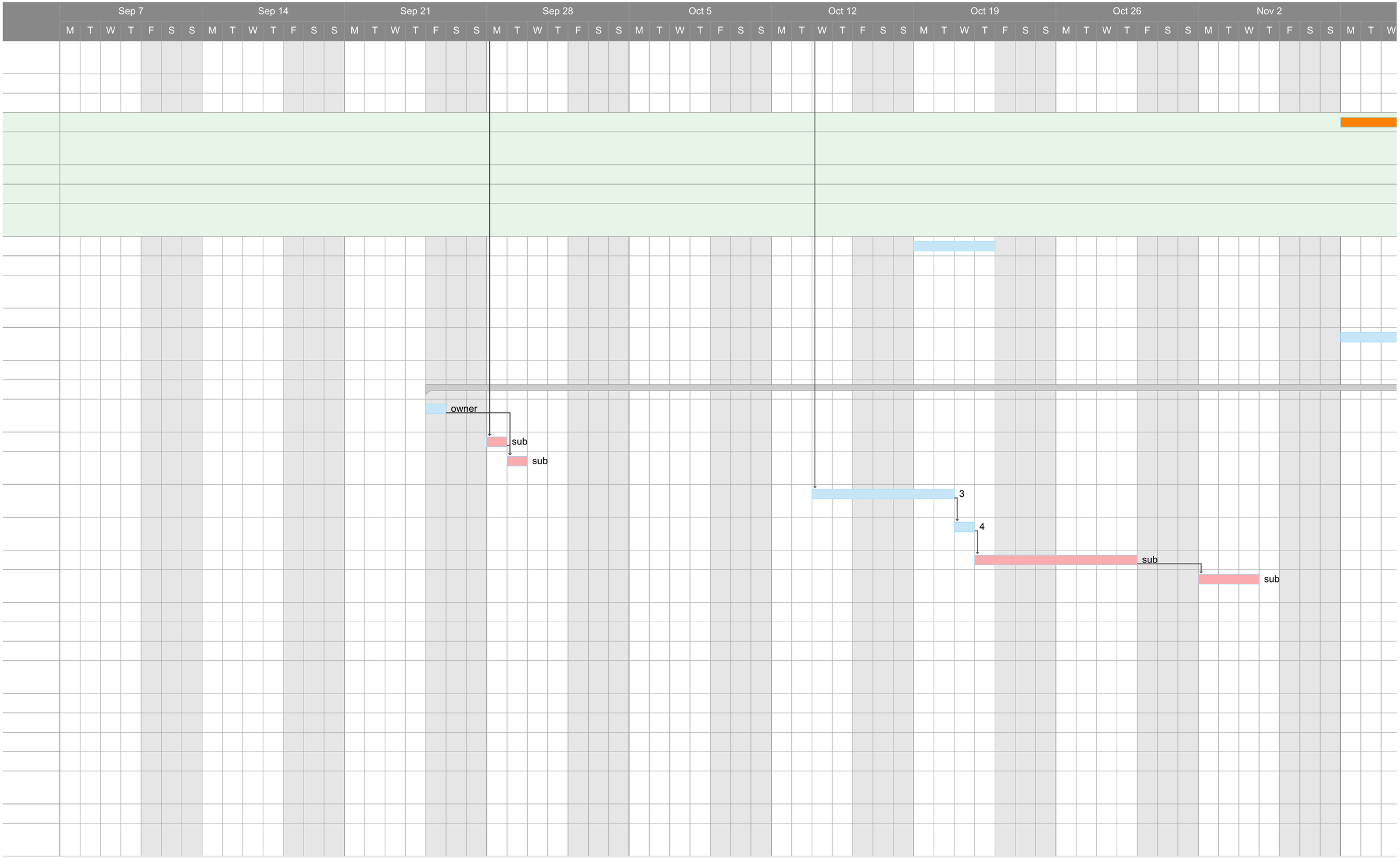

Nov 9
Nov 16
Nov 23
Nov 30
Dec 7
Dec 14
Dec 21
Dec 28
Jan 4
Jan 11
T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M
sub
sub
sub
NA
sub
4
4
2
2
sub
4
5

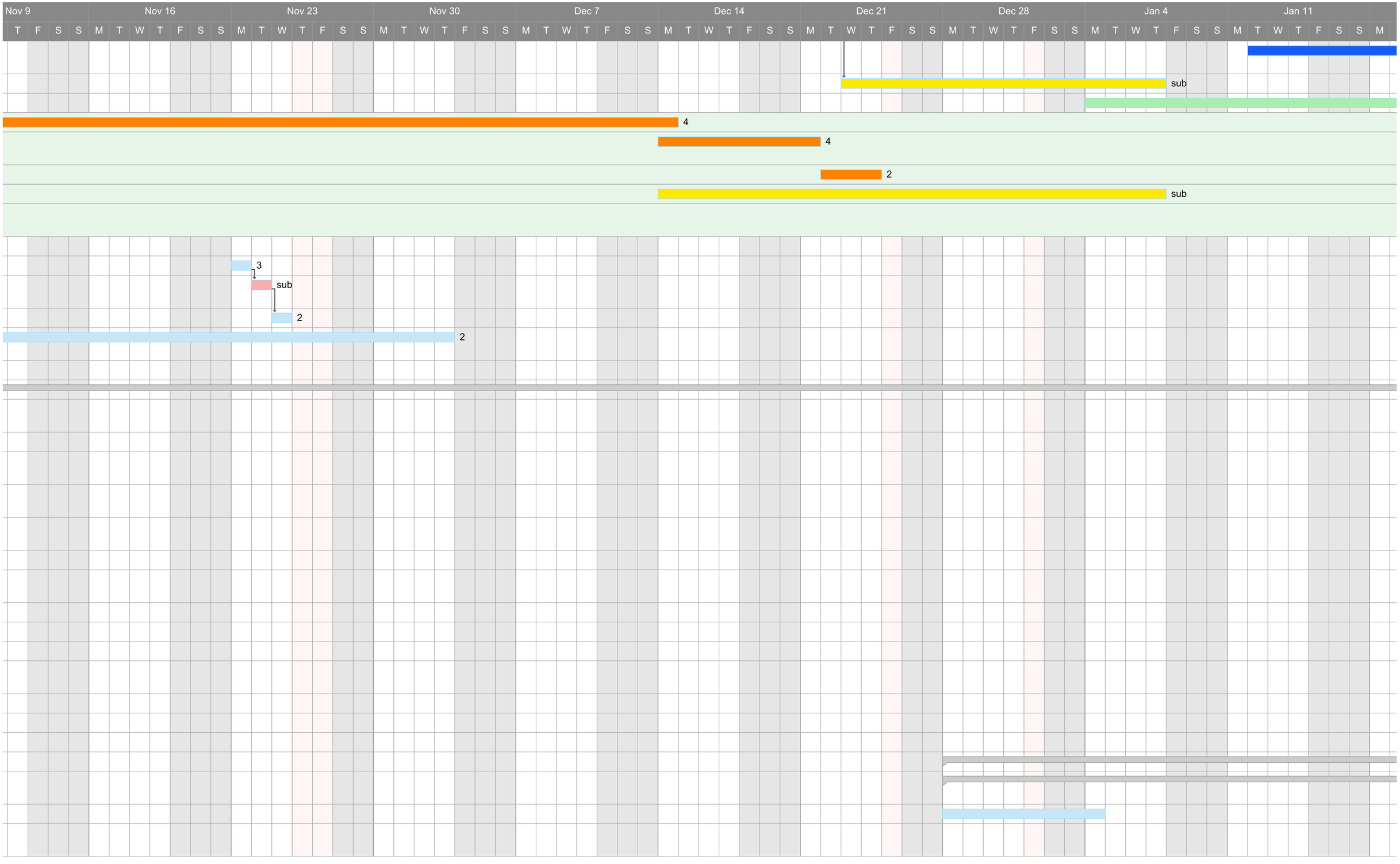

Jan 18
Jan 25
Feb 1
Feb 8
Feb 15
Feb 22
Mar 1
Mar 8
Mar 15
Mar 22
T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S
3
sub

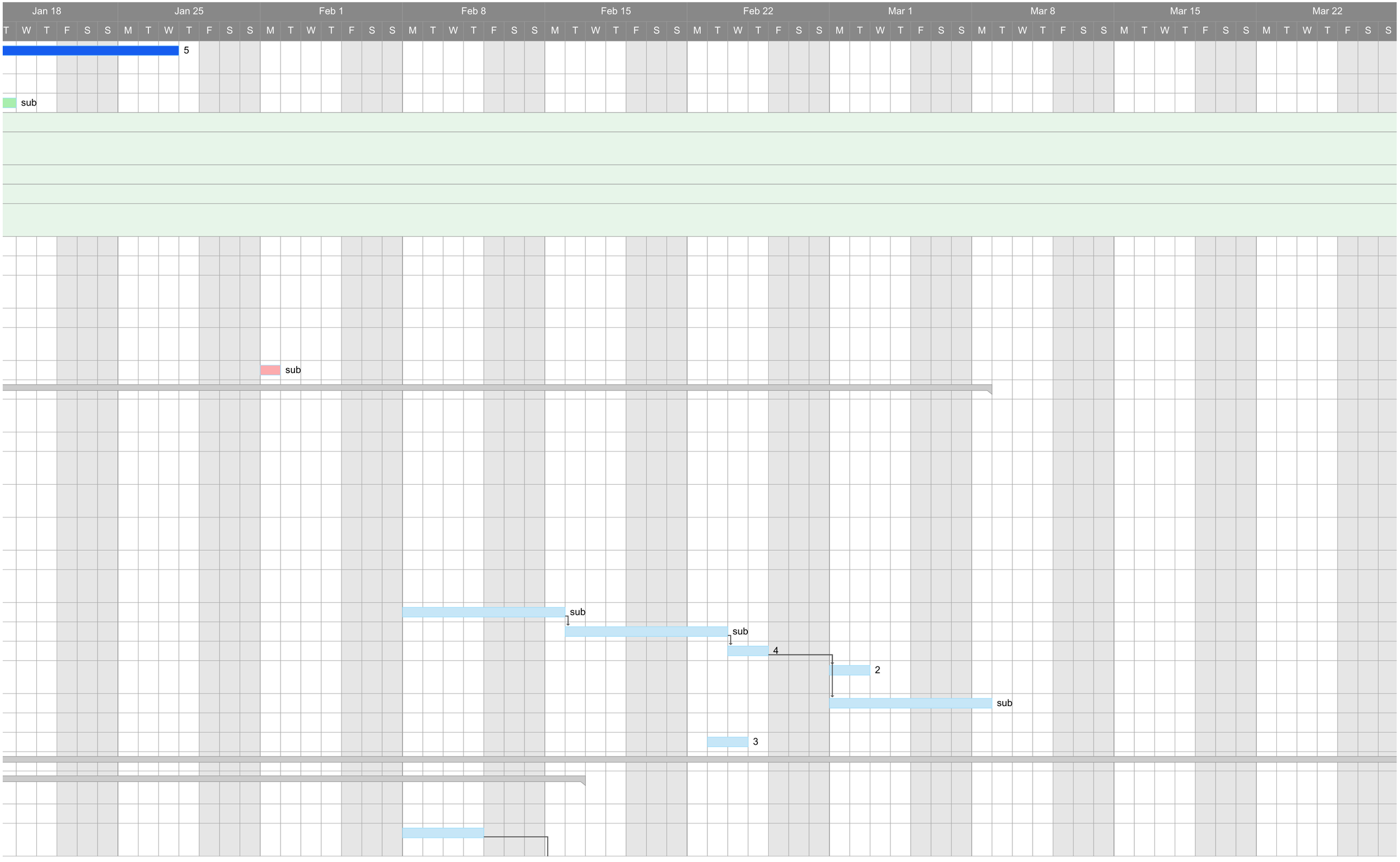
Mar 29							Apr 5							Apr 12							Apr 19							Apr 26						
M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S

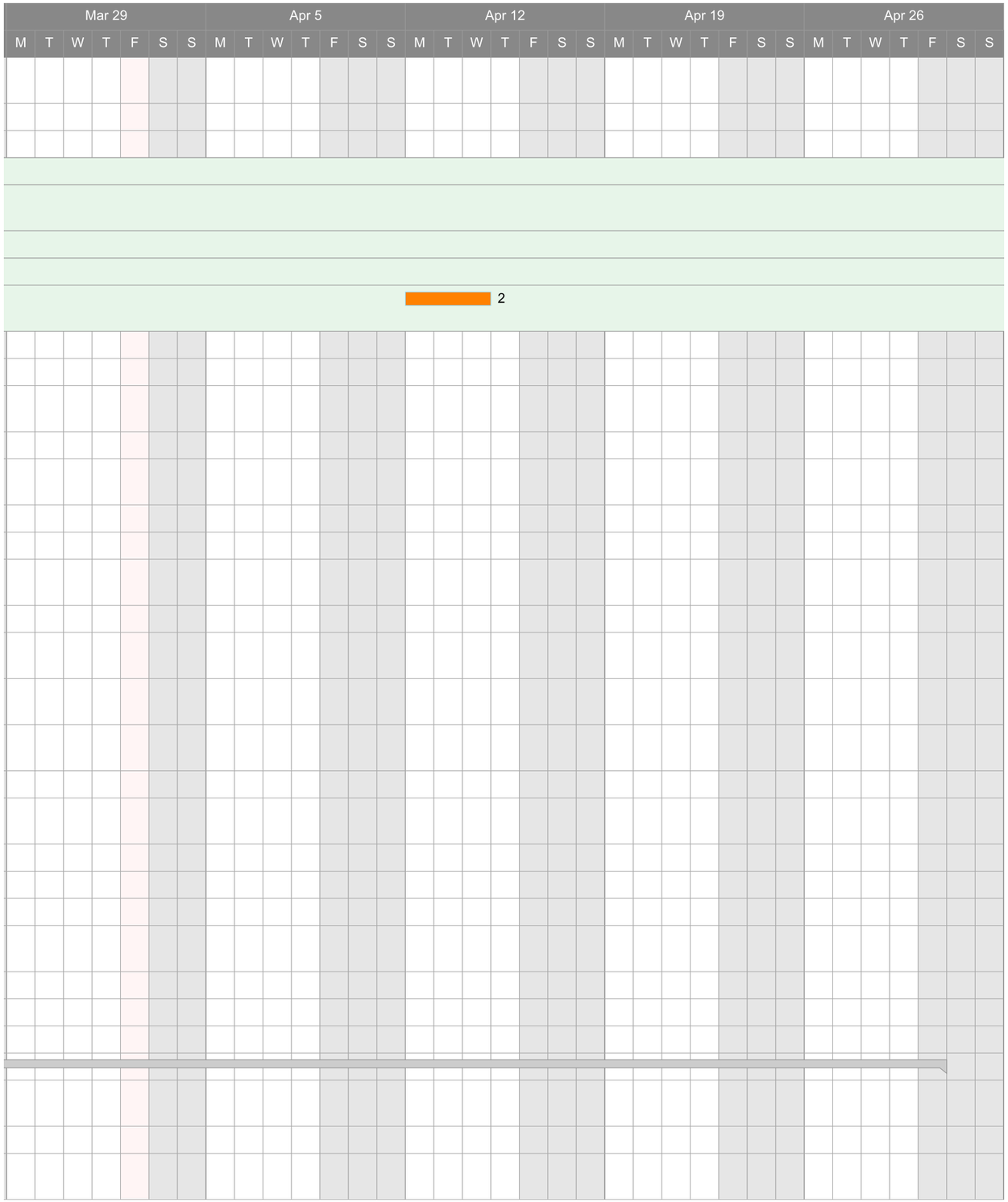
sub

	Task Name	Hours	Duration	Manpower	Start	Finish	% Complete	Predecessors	Comments
65	HVAC Equipment tie ins heat PDU's		10d	5	01/12/21	01/27/21			
66	HVAC SUB Insulation		10d	sub	12/23/20	01/07/21		63	
67	HVAC SUB Controls		10d	sub	01/04/21	01/19/21			
68	Piping R/I		20d	4	11/09/20	12/14/20			
69	Piping Equip Connections		5d	4	12/14/20	12/21/20			
70	Piping Trim Out		3d	2	12/22/20	12/24/20			
71	Piping SUB Insulation		16d	sub	12/14/20	01/07/21			
72	Label, Valve Tag & Equip Tag		3d	2	04/12/21	04/14/21			
73	sprinkler work		4d		10/19/20	10/22/20			
74	cut in new roof curb		1d	3	11/23/20	11/23/20			
75	roofer to patch in new curb		1d	sub	11/24/20	11/24/20		74	
76	set new roof vents		1d	2	11/25/20	11/25/20		75	
77	Electrical work for new equipment		15d	2	11/09/20	12/03/20			
78	Re-Install window		1d	sub	02/01/21	02/01/21			
79	**Pool Area**		93d		09/25/20	03/08/21	0%		
80	items removed from pool area		1d	owner	09/25/20	09/25/20			
81	Floor protection		1d	sub	09/28/20	09/28/20		42, 80	
82	Demo Drywall under balcony		1d	sub	09/29/20	09/29/20		81, 80	
83	Install new duct under balcony		4d	3	10/14/20	10/20/20	0%	60	
84	Insulate new duct under balcony		1d	4	10/21/20	10/21/20		83	
85	re-install sheetrock		5d	sub	10/22/20	10/29/20		84	
86	finish and paint sheetrock		3d	sub	11/02/20	11/04/20		85	
87	Duct cleaning		5d	sub	02/08/21	02/15/21		0	
88	Duct Sealing		5d	sub	02/16/21	02/23/21		87	
89	Install GRD's		2d	4	02/24/21	02/25/21		88	
90	Move Destratification fans		2d	2	03/01/21	03/02/21		89	
91	TAB pool area		5d	sub	03/01/21	03/08/21		89	
92	Punch list for pool area			3					
93	Final clean pool area		2d	3	02/23/21	02/24/21			
94	**Commissioning/Start up**		72d		12/28/20	04/30/21	0%		
95	**Mech room 112 & Cooling tower**		30d		12/28/20	02/16/21			
96	Filling and Flushing		5d		12/28/20	01/04/21			
97	Cooling tower start up		4d		02/08/21	02/11/21			


Sep 7
Sep 14
Sep 21
Sep 28
Oct 5
Oct 12
Oct 19
Oct 26
Nov 2
M T W T F S S
owner
sub
sub
3
4
sub
sub


Nov 9
Nov 16
Nov 23
Nov 30
Dec 7
Dec 14
Dec 21
Dec 28
Jan 4
Jan 11
T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M
sub
4
4
2
sub
3
sub
2
2

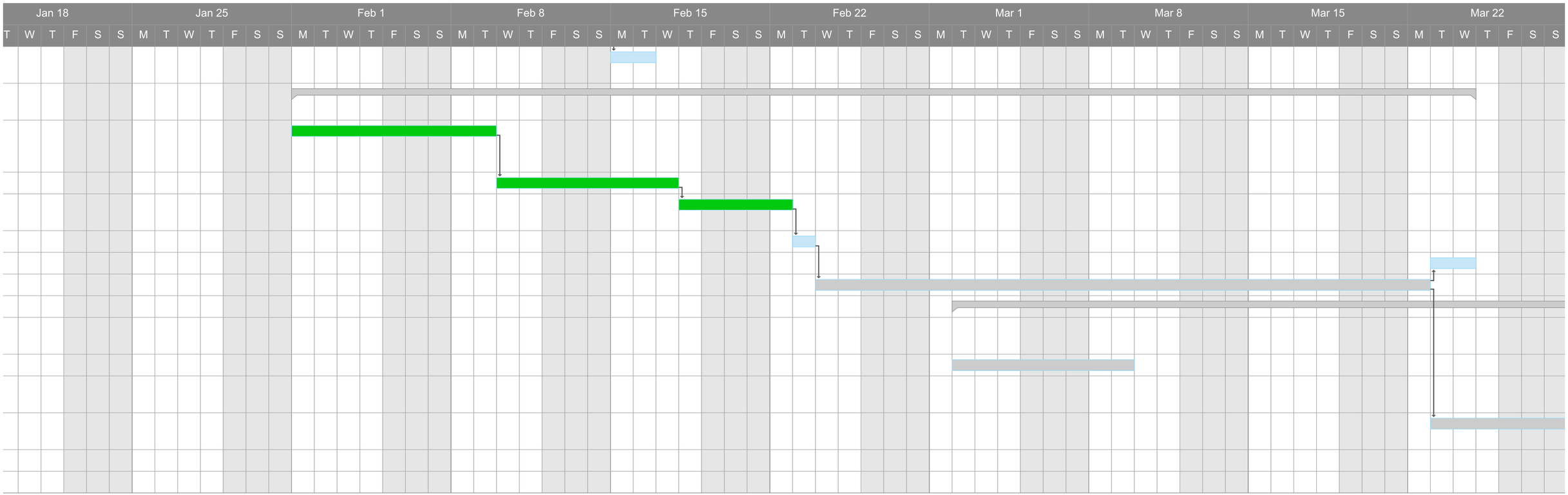

Jan 18
Jan 25
Feb 1
Feb 8
Feb 15
Feb 22
Mar 1
Mar 8
Mar 15
Mar 22
T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S
5
sub
sub
sub
sub
sub
4
2
sub
3

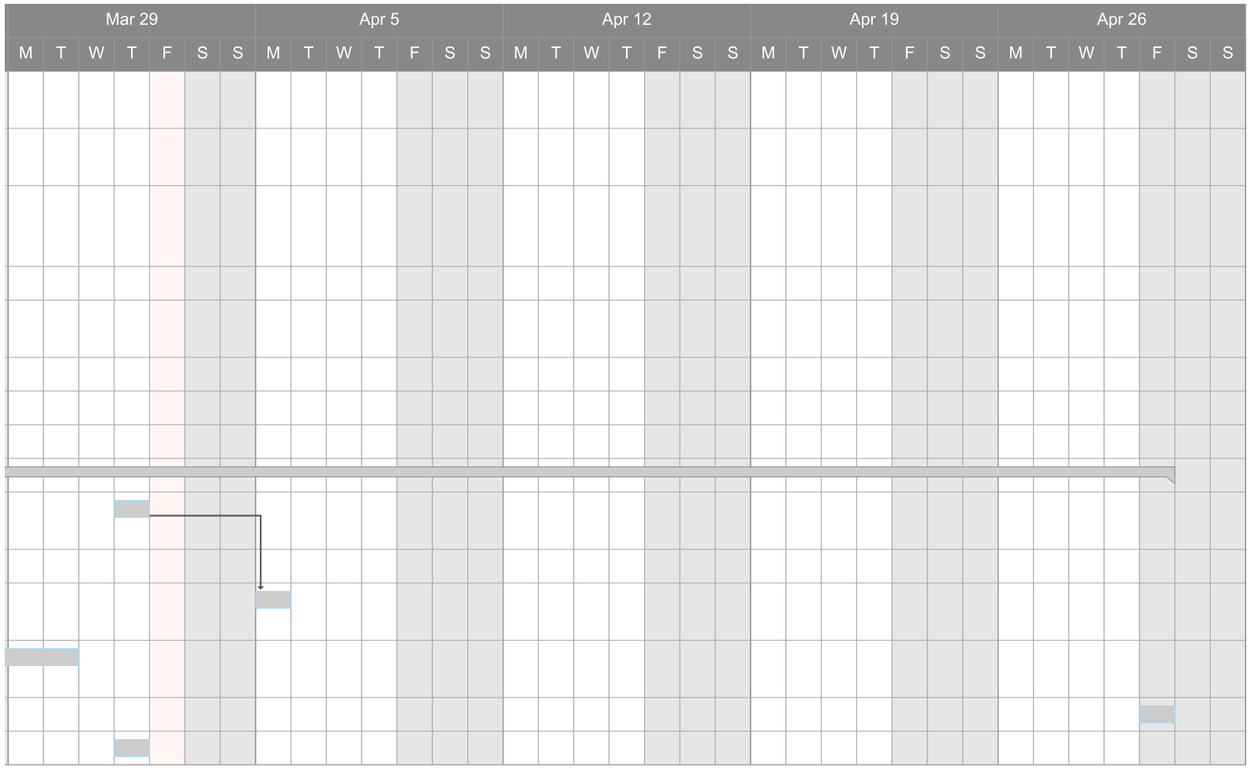

Mar 29
Apr 5
Apr 12
Apr 19
Apr 26
M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S
2

	Task Name	Hours	Duration	Manpower	Start	Finish	% Complete	Predecessors	Comments
98	New boiler start up mech 112		2d		02/15/21	02/16/21		97	
99	**2nd Floor Startup mech room 210**		31d		02/01/21	03/24/21	0%		
100	Pool Dehumidification Units start up		6d		02/01/21	02/09/21			
101	WSHP's start up		5d		02/10/21	02/17/21	0%	100	
102	Misc. equipment start up		2d		02/18/21	02/22/21		101	
103	ERV start up		1d		02/23/21	02/23/21		102	
104	Smoke test duct		2d		03/23/21	03/24/21		105	
105	Test and balance		15d		02/24/21	03/22/21		103	
106	**Completion**		35d		03/02/21	04/30/21			
107	Substantial Completion		1d		04/01/21	04/01/21			
108	demobilize		5d		03/02/21	03/09/21			
109	Final walk through and punch list		1d		04/05/21	04/05/21		107	
110	3rd party commisioning		5d		03/23/21	03/30/21		105	
111	Final completion		1d		04/30/21	04/30/21			
112	Warranty and O&M's		1d		04/01/21	04/01/21			

	Sep 7							Sep 14							Sep 21							Sep 28							Oct 5							Oct 12							Oct 19							Oct 26							Nov 2									
	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W

Nov 9				Nov 16							Nov 23							Nov 30							Dec 7							Dec 14							Dec 21							Dec 28							Jan 4							Jan 11							
T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M


Jan 18
Jan 25
Feb 1
Feb 8
Feb 15
Feb 22
Mar 1
Mar 8
Mar 15
Mar 22
T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S


Mar 29
Apr 5
Apr 12
Apr 19
Apr 26
M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S