

Anvil Design Services offers both Basic and Extended Services...

Contact your Anvil representative for more information.

Basic Services

Anvil Design Services produces fabrication drawings of mechanical room piping 2½" and larger including chillers, heat exchangers, boilers, and pumps from contractor supplied flow diagrams, mechanical drawings, and approved submittals and specifications.

The drawings include a Bill of Materials with tags referencing the components in the mechanical room. The piping is color coded by service and is represented in 3-D with plan, isometric, and elevation views.

Initially, Anvil personnel meet with you to determine your piping preferences. The project scope and fee is agreed upon in a Design Services contract.

The plans and specifications are then interpreted in terms of economy, accuracy, and compliance. We may suggest modifications in arrangement, construction, equipment location, or product to attain the desired results. Piping layouts are carefully analyzed to determine whether further economies can be attained in the piping system.

Piping drawings are then prepared to determine the most efficient pipe routing, taking equipment location and any interferences into consideration. Preliminary prints are sent to you for revision or approval.

Upon approval, (4) sets of drawings with tags and Bills of Materials of the included system components are sent to you. Copies of the electronic data file of the project drawings are available at no extra charge. This brochure is an example of the finished product.

With Basic Services, you can plan the mechanical room. The preliminary drawings can be taken to coordination meetings with other trades to "reserve" space by "getting in" first. Also, your field supervisor can spend more time supervising and not calculating pipe lengths and pipe routing. The components can be grouped from the finished drawings for better workflow planning.

We usually reduce fitting counts by 10%-15% by moving equipment whenever possible, usually less than a foot. The more movement that is allowed, the more savings can be realized.

Extended Services:

Extended Services include any scope beyond Basic Services. There are many different types of services offered as extended:

- BOM by component (pump, chiller) or by system
- Unique Tagging – adding unique tags to individual components
- Air Handling Units – with associated ductwork
- Single Line Routing – non-dimensional
- Distribution Piping
- Dimensioned Floor Penetrations
- AWWA Piping - Total Scope
- Commercial Piping
- Oil Field Piping
- Retrofit Projects - Field Survey
- Hybrid Systems
- Anything Else

PIPE

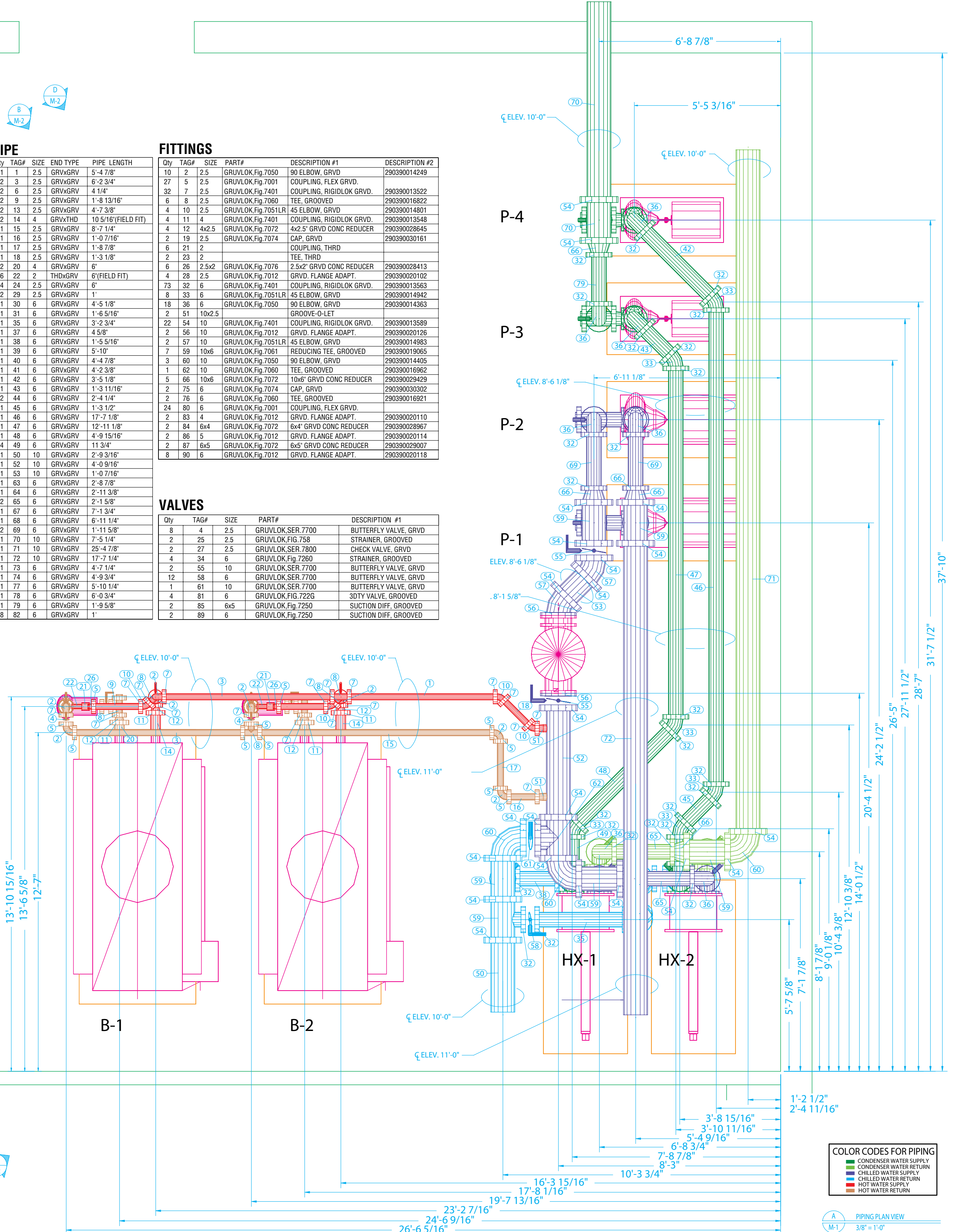
| Qty | TAG# | SIZE | END TYPE | PIPE LENGTH |
|-----|------|------|----------|---------------------|
| 1 | 1 | 2.5 | GRVxGRV | 5'-4 7/8" |
| 2 | 3 | 2.5 | GRVxGRV | 6'-2 3/4" |
| 2 | 6 | 2.5 | GRVxGRV | 4 1/4" |
| 2 | 9 | 2.5 | GRVxGRV | 1'-8 13/16" |
| 2 | 13 | 2.5 | GRVxGRV | 4'-7 3/8" |
| 2 | 14 | 4 | GRVxTHD | 10 5/16"(FIELD FIT) |
| 1 | 15 | 2.5 | GRVxGRV | 8'-7 1/4" |
| 1 | 16 | 2.5 | GRVxGRV | 1'-0 7/16" |
| 1 | 17 | 2.5 | GRVxGRV | 1'-8 7/8" |
| 1 | 18 | 2.5 | GRVxGRV | 1'-3 1/8" |
| 2 | 20 | 4 | GRVxGRV | 6" |
| 6 | 22 | 2 | THDxGRV | 6"(FIELD FIT) |
| 4 | 24 | 2.5 | GRVxGRV | 6" |
| 2 | 29 | 2.5 | GRVxGRV | 1" |
| 1 | 30 | 6 | GRVxGRV | 4'-5 1/8" |
| 1 | 31 | 6 | GRVxGRV | 1'-6 5/16" |
| 1 | 35 | 6 | GRVxGRV | 3'-2 3/4" |
| 1 | 37 | 6 | GRVxGRV | 4 5/8" |
| 1 | 38 | 6 | GRVxGRV | 1'-5 5/16" |
| 1 | 39 | 6 | GRVxGRV | 1'-10" |
| 1 | 40 | 6 | GRVxGRV | 4'-4 7/8" |
| 1 | 41 | 6 | GRVxGRV | 4'-2 3/8" |
| 1 | 42 | 6 | GRVxGRV | 3'-5 1/8" |
| 1 | 43 | 6 | GRVxGRV | 1'-3 11/16" |
| 2 | 44 | 6 | GRVxGRV | 2'-4 1/4" |
| 1 | 45 | 6 | GRVxGRV | 1'-3 1/2" |
| 1 | 46 | 6 | GRVxGRV | 17'-7 1/8" |
| 1 | 47 | 6 | GRVxGRV | 12'-11 1/8" |
| 1 | 48 | 6 | GRVxGRV | 4'-9 15/16" |
| 4 | 49 | 6 | GRVxGRV | 11 3/4" |
| 1 | 50 | 10 | GRVxGRV | 2'-9 3/16" |
| 1 | 52 | 10 | GRVxGRV | 4'-0 9/16" |
| 1 | 53 | 10 | GRVxGRV | 1'-0 7/16" |
| 1 | 63 | 6 | GRVxGRV | 2'-8 7/8" |
| 1 | 64 | 6 | GRVxGRV | 2'-11 3/8" |
| 2 | 65 | 6 | GRVxGRV | 2'-1 5/8" |
| 1 | 67 | 6 | GRVxGRV | 7'-1 3/4" |
| 1 | 68 | 6 | GRVxGRV | 6'-11 1/4" |
| 2 | 69 | 6 | GRVxGRV | 1'-11 5/8" |
| 1 | 70 | 10 | GRVxGRV | 7'-5 1/4" |
| 1 | 71 | 10 | GRVxGRV | 25'-4 7/8" |
| 1 | 72 | 10 | GRVxGRV | 17'-7 1/4" |
| 1 | 73 | 6 | GRVxGRV | 4'-7 1/4" |
| 1 | 74 | 6 | GRVxGRV | 4'-9 3/4" |
| 1 | 77 | 6 | GRVxGRV | 5'-10 1/4" |
| 1 | 78 | 6 | GRVxGRV | 6'-0 3/4" |
| 1 | 79 | 6 | GRVxGRV | 1'-9 5/8" |
| 8 | 82 | 6 | GRVxGRV | 1" |

FITTINGS

| Qty | TAG# | SIZE | PART# | DESCRIPTION #1 | DESCRIPTION #2 |
|-----|------|--------|---------------------|--------------------------|----------------|
| 10 | 2 | 2.5 | GRUVLOK, Fig.7050 | 90 ELBOW, GRVD | 290390014249 |
| 27 | 5 | 2.5 | GRUVLOK, Fig.7001 | COUPLING, FLEX GRVD. | |
| 32 | 7 | 2.5 | GRUVLOK, Fig.7401 | COUPLING, RIGIDLOK GRVD. | 290390013522 |
| 6 | 8 | 2.5 | GRUVLOK, Fig.7060 | TEE, GROOVED | 290390016822 |
| 4 | 10 | 2.5 | GRUVLOK, Fig.7051LR | 45 ELBOW, GRVD | 290390014801 |
| 4 | 11 | 4 | GRUVLOK, Fig.7401 | COUPLING, RIGIDLOK GRVD. | 290390013548 |
| 4 | 12 | 4x2.5 | GRUVLOK, Fig.7072 | 4x2.5' GRVD CONC REDUCER | 290390028645 |
| 2 | 19 | 2.5 | GRUVLOK, Fig.7074 | CAP, GRVD | 290390030161 |
| 6 | 21 | 2 | | COUPLING, THRD | |
| 2 | 23 | 2 | | TEE, THRD | |
| 6 | 26 | 2.5x2 | GRUVLOK, Fig.7076 | 2.5x2' GRVD CONC REDUCER | 290390028413 |
| 4 | 28 | 2.5 | GRUVLOK, Fig.7012 | GRVD, FLANGE ADAPT. | 290390020102 |
| 73 | 32 | 6 | GRUVLOK, Fig.7401 | COUPLING, RIGIDLOK GRVD. | 290390013563 |
| 8 | 33 | 6 | GRUVLOK, Fig.7051LR | 45 ELBOW, GRVD | 290390014942 |
| 18 | 36 | 6 | GRUVLOK, Fig.7050 | 90 ELBOW, GRVD | 290390014363 |
| 2 | 51 | 10x2.5 | | GROOVE-O-LET | |
| 22 | 54 | 10 | GRUVLOK, Fig.7401 | COUPLING, RIGIDLOK GRVD. | 290390013589 |
| 2 | 56 | 10 | GRUVLOK, Fig.7012 | GRVD, FLANGE ADAPT. | 290390020126 |
| 2 | 57 | 10 | GRUVLOK, Fig.7051LR | 45 ELBOW, GRVD | 290390014983 |
| 7 | 59 | 10x6 | GRUVLOK, Fig.7061 | REDUCING TEE, GROOVED | 290390019065 |
| 3 | 60 | 10 | GRUVLOK, Fig.7050 | 90 ELBOW, GRVD | 290390014405 |
| 1 | 62 | 10 | GRUVLOK, Fig.7060 | TEE, GROOVED | 290390016962 |
| 5 | 66 | 10x6 | GRUVLOK, Fig.7072 | 10x6' GRVD CONC REDUCER | 290390029429 |
| 2 | 75 | 6 | GRUVLOK, Fig.7074 | CAP, GRVD | 290390030302 |
| 2 | 76 | 6 | GRUVLOK, Fig.7060 | TEE, GROOVED | 290390016921 |
| 24 | 80 | 6 | GRUVLOK, Fig.7001 | COUPLING, FLEX GRVD. | |
| 2 | 83 | 4 | GRUVLOK, Fig.7012 | GRVD, FLANGE ADAPT. | 290390020110 |
| 2 | 84 | 6x4 | GRUVLOK, Fig.7072 | 6x4' GRVD CONC REDUCER | 290390028967 |
| 2 | 86 | 5 | GRUVLOK, Fig.7012 | GRVD, FLANGE ADAPT. | 290390020114 |
| 2 | 87 | 6x5 | GRUVLOK, Fig.7072 | 6x5' GRVD CONC REDUCER | 290390029007 |
| 8 | 90 | 6 | GRUVLOK, Fig.7012 | GRVD, FLANGE ADAPT. | 290390020118 |

VALVES

| Qty | TAG# | SIZE | PART# | DESCRIPTION #1 |
|-----|------|------|-------------------|-----------------------|
| 8 | 4 | 2.5 | GRUVLOK, SER.7700 | BUTTERFLY VALVE, GRVD |
| 2 | 25 | 2.5 | GRUVLOK, FIG.758 | STRAINER, GROOVED |
| 2 | 27 | 2.5 | GRUVLOK, SER.7800 | CHECK VALVE, GRVD |
| 4 | 34 | 6 | GRUVLOK, Fig.7260 | STRAINER, GROOVED |
| 2 | 55 | 10 | GRUVLOK, SER.7700 | BUTTERFLY VALVE, GRVD |
| 12 | 58 | 6 | GRUVLOK, SER.7700 | BUTTERFLY VALVE, GRVD |
| 1 | 61 | 10 | GRUVLOK, SER.7700 | BUTTERFLY VALVE, GRVD |
| 4 | 81 | 6 | GRUVLOK, FIG.722G | 3DTY VALVE, GROOVED |
| 2 | 85 | 6x5 | GRUVLOK, Fig.7250 | SUCTION DIFF, GROOVED |
| 2 | 89 | 6 | GRUVLOK, Fig.7250 | SUCTION DIFF, GROOVED |



| | |
|--------|------------------------|
| Green | CONDENSER WATER SUPPLY |
| Blue | CONDENSER WATER RETURN |
| Yellow | CHILLED WATER SUPPLY |
| Red | CHILLED WATER RETURN |
| Orange | HOT WATER SUPPLY |
| Purple | HOT WATER RETURN |

A
M-1
PIPING PLAN VIEW
3/8" = 1'-0"

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Regional Distribution & Customer Service Center

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Anvil International Canada

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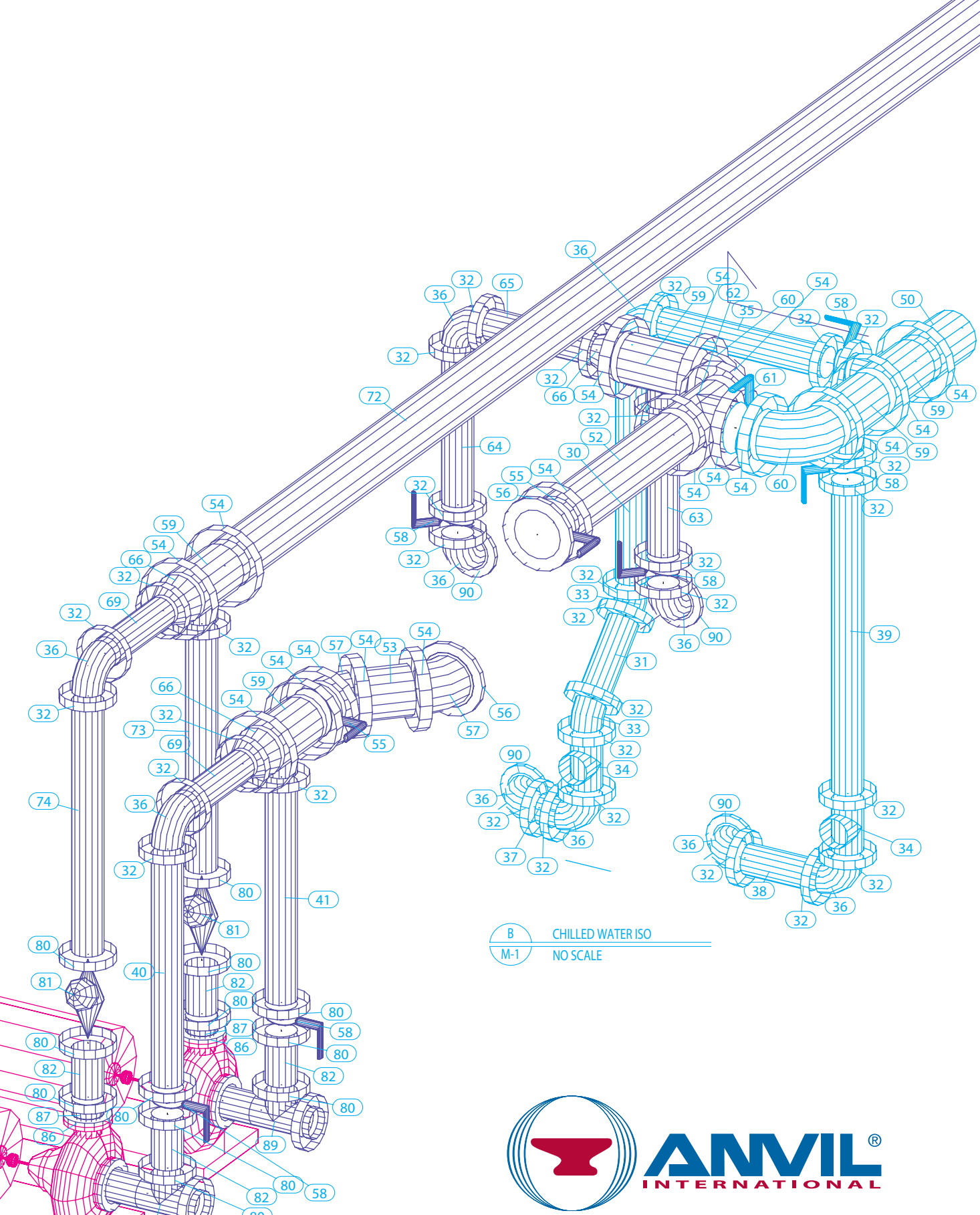
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B CHILLED WATER ISO
M-1 NO SCALE



Design Services

BUILDING CONNECTIONS THAT LAST

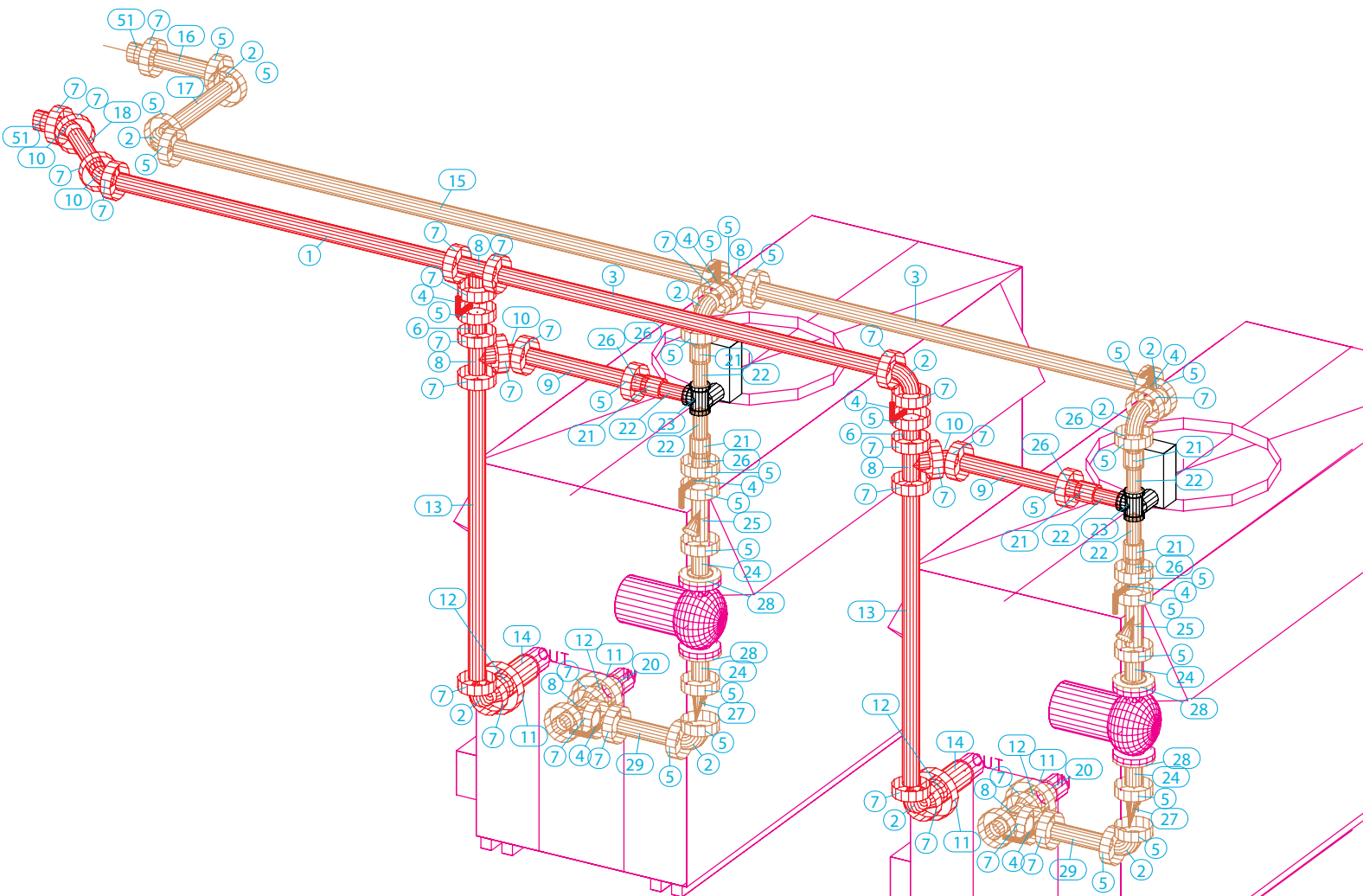


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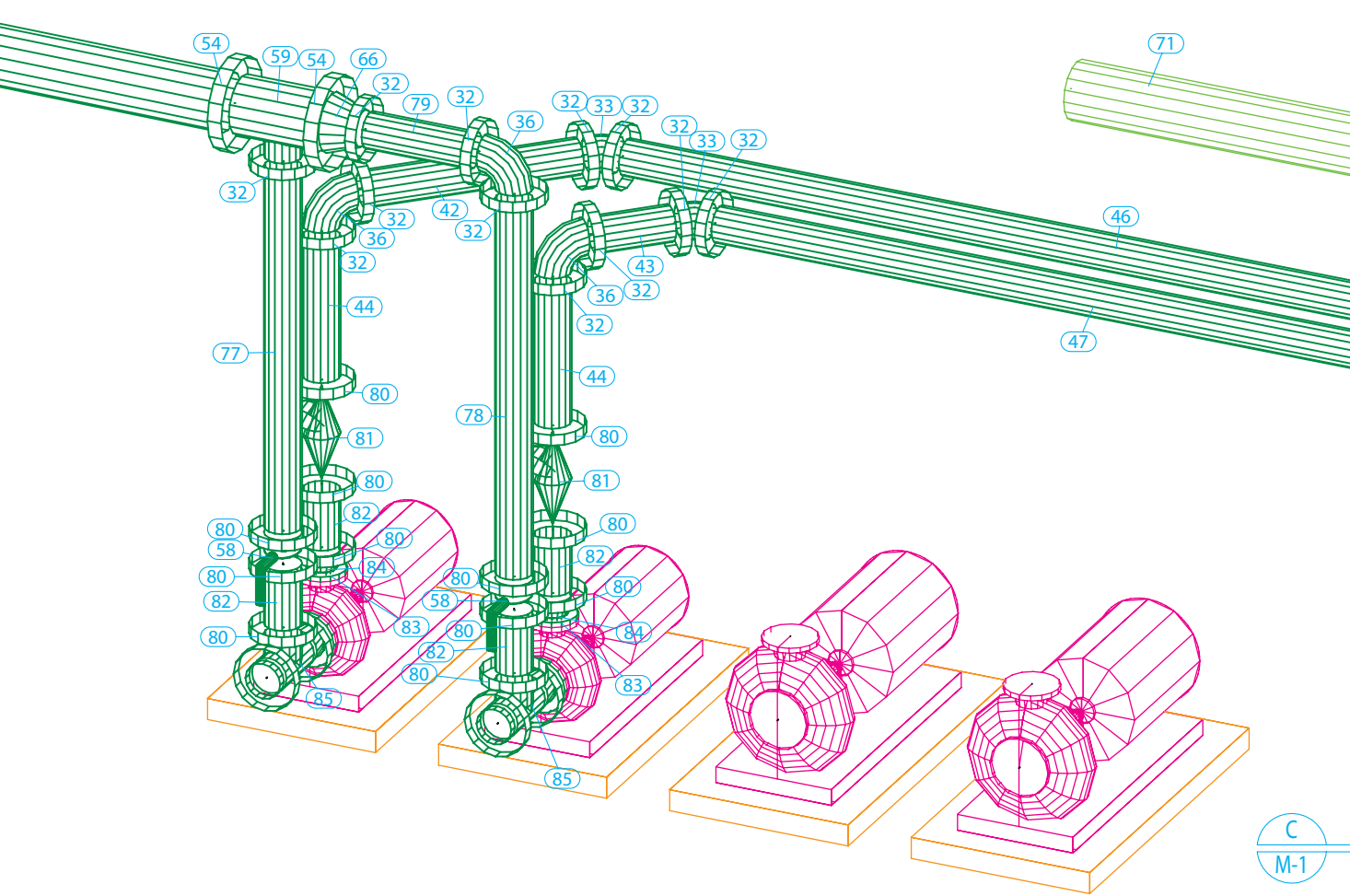
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Revision Date: 2.8.12

| PIPE | | | | PIPE | | | | FITTINGS | | | | | | | |
|------|------|------|----------|----------------------|-----|------|------|----------|-------------|-----|------|--------|---------------------|--------------------------|----------------|
| Qty | TAG# | SIZE | END TYPE | PIPE LENGTH | Qty | TAG# | SIZE | END TYPE | PIPE LENGTH | Qty | TAG# | SIZE | PART# | DESCRIPTION #1 | DESCRIPTION #2 |
| 1 | 1 | 2.5 | GRVxGRV | 5'-4 7/8" | 2 | 44 | 6 | GRVxGRV | 2'-4 1/4" | 10 | 2 | 2.5 | GRUVLOK, Fig.7050 | 90 ELBOW, GRVD | 290390014249 |
| 2 | 3 | 2.5 | GRVxGRV | 8'-2 3/4" | 1 | 45 | 6 | GRVxGRV | 1'-3 1/2" | 27 | 5 | 2.5 | GRUVLOK, Fig.7001 | COUPLING, FLEX GRVD. | |
| 2 | 6 | 2.5 | GRVxGRV | 4'1 1/4" | 1 | 46 | 6 | GRVxGRV | 17'-7 1/8" | 32 | 7 | 2.5 | GRUVLOK, Fig.7401 | COUPLING, RIGIDLOK GRVD. | 290390013522 |
| 2 | 9 | 2.5 | GRVxGRV | 1'-8 13/16" | 1 | 47 | 6 | GRVxGRV | 12'-11 1/8" | 6 | 8 | 2.5 | GRUVLOK, Fig.7060 | TEE, GROOVED | 290390016822 |
| 2 | 13 | 2.5 | GRVxGRV | 4'-7 3/8" | 1 | 48 | 6 | GRVxGRV | 4'-9 15/16" | 4 | 10 | 2.5 | GRUVLOK, Fig.7051LR | 45 ELBOW, GRVD | 290390014801 |
| 2 | 14 | 4 | GRVxTHD | 10 5/16" (FIELD FIT) | 4 | 49 | 6 | GRVxGRV | 11 3/4" | 4 | 11 | 4 | GRUVLOK, Fig.7401 | COUPLING, RIGIDLOK GRVD. | 290390013548 |
| 1 | 15 | 2.5 | GRVxGRV | 8'-7 1/4" | 1 | 50 | 10 | GRVxGRV | 2'-9 3/16" | 4 | 12 | 4x2.5 | GRUVLOK, Fig.7072 | 4x2.5' GRVD CONC REDUCER | 290390028645 |
| 1 | 16 | 2.5 | GRVxGRV | 1'-0 7/16" | 1 | 52 | 10 | GRVxGRV | 4'-0 9/16" | 2 | 19 | 2.5 | GRUVLOK, Fig.7074 | CAP, GRVD | 290390030161 |
| 1 | 17 | 2.5 | GRVxGRV | 1'-8 7/8" | 1 | 53 | 10 | GRVxGRV | 1'-0 7/16" | 6 | 21 | 2 | | COUPLING, THRD | |
| 1 | 18 | 2.5 | GRVxGRV | 1'-3 1/8" | 1 | 63 | 6 | GRVxGRV | 2'-8 7/8" | 2 | 23 | 2 | | TEE, THRD | |
| 2 | 20 | 4 | GRVxGRV | 6" | 1 | 64 | 6 | GRVxGRV | 2'-11 3/8" | 6 | 26 | 2.5x2 | GRUVLOK, Fig.7076 | 2.5x2' GRVD CONC REDUCER | 290390028413 |
| 6 | 22 | 2 | THDxGRV | 6" (FIELD FIT) | 2 | 65 | 6 | GRVxGRV | 2'-1 5/8" | 4 | 28 | 2.5 | GRUVLOK, Fig.7012 | GRVD, FLANGE ADAPT. | 290390020102 |
| 4 | 24 | 2.5 | GRVxGRV | 6" | 1 | 67 | 6 | GRVxGRV | 7'-1 3/4" | 73 | 32 | 6 | GRUVLOK, Fig.7401 | COUPLING, RIGIDLOK GRVD. | 290390013563 |
| 2 | 29 | 2.5 | GRVxGRV | 1' | 1 | 68 | 6 | GRVxGRV | 6'-11 1/4" | 8 | 33 | 6 | GRUVLOK, Fig.7051LR | 45 ELBOW, GRVD | 290390014942 |
| 1 | 30 | 6 | GRVxGRV | 4'-5 1/8" | 2 | 69 | 6 | GRVxGRV | 1'-11 5/8" | 18 | 36 | 6 | GRUVLOK, Fig.7050 | 90 ELBOW, GRVD | 290390014363 |
| 1 | 31 | 6 | GRVxGRV | 1'-6 5/16" | 1 | 70 | 10 | GRVxGRV | 7'-5 1/4" | 2 | 51 | 10x2.5 | | GROOVE-O-LET | |
| 1 | 35 | 6 | GRVxGRV | 3'-2 3/4" | 1 | 71 | 10 | GRVxGRV | 25'-4 7/8" | 22 | 54 | 10 | GRUVLOK, Fig.7401 | COUPLING, RIGIDLOK GRVD. | 290390013589 |
| 1 | 37 | 6 | GRVxGRV | 4 5/8" | 1 | 72 | 10 | GRVxGRV | 17'-7 1/4" | 2 | 56 | 10 | GRUVLOK, Fig.7012 | GRVD, FLANGE ADAPT. | 290390020126 |
| 1 | 38 | 6 | GRVxGRV | 1'-5 5/16" | 1 | 73 | 6 | GRVxGRV | 4'-7 1/4" | 2 | 57 | 10 | GRUVLOK, Fig.7051LR | 45 ELBOW, GRVD | 290390014983 |
| 1 | 39 | 6 | GRVxGRV | 5'-10" | 1 | 74 | 6 | GRVxGRV | 4'-9 3/4" | 7 | 59 | 10x6 | GRUVLOK, Fig.7061 | REDUCING TEE, GROOVED | 290390019065 |
| 1 | 40 | 6 | GRVxGRV | 4'-4 7/8" | 1 | 77 | 6 | GRVxGRV | 5'-10 1/4" | 3 | 60 | 10 | GRUVLOK, Fig.7050 | 90 ELBOW, GRVD | 290390014405 |
| 1 | 41 | 6 | GRVxGRV | 4'-2 3/8" | 1 | 78 | 6 | GRVxGRV | 6'-0 3/4" | 1 | 62 | 10 | GRUVLOK, Fig.7060 | TEE, GROOVED | 290390016962 |
| 1 | 42 | 6 | GRVxGRV | 3'-5 1/8" | 1 | 79 | 6 | GRVxGRV | 1'-9 5/8" | 5 | 66 | 10x6 | GRUVLOK, Fig.7072 | 10x6' GRVD CONC REDUCER | 290390029429 |
| 1 | 43 | 6 | GRVxGRV | 1'-3 11/16" | 8 | 82 | 6 | GRVxGRV | 1' | 2 | 75 | 6 | GRUVLOK, Fig.7074 | CAP, GRVD | 290390030302 |
| | | | | | | | | | | 2 | 76 | 6 | GRUVLOK, Fig.7060 | TEE, GROOVED | 290390016921 |
| | | | | | | | | | | 24 | 80 | 6 | GRUVLOK, Fig.7001 | COUPLING, FLEX GRVD. | |
| | | | | | | | | | | 2 | 83 | 4 | GRUVLOK, Fig.7012 | GRVD, FLANGE ADAPT. | 290390020110 |
| | | | | | | | | | | 2 | 84 | 6x4 | GRUVLOK, Fig.7072 | 6x4' GRVD CONC REDUCER | 290390028967 |
| | | | | | | | | | | 2 | 86 | 5 | GRUVLOK, Fig.7012 | GRVD, FLANGE ADAPT. | 290390020114 |
| | | | | | | | | | | 2 | 87 | 6x5 | GRUVLOK, Fig.7072 | 6x5' GRVD CONC REDUCER | 290390029007 |
| | | | | | | | | | | 8 | 90 | 6 | GRUVLOK, Fig.7012 | GRVD, FLANGE ADAPT. | 290390020118 |

| VALVES | | | |
|--------|------|------|---|
| Qty | TAG# | SIZE | DESCRIPTION #1 |
| 8 | 4 | 2.5 | GRUVLOK, SER.7700 BUTTERFLY VALVE, GRVD |
| 2 | 25 | 2.5 | GRUVLOK, FIG.758 STRAINER, GROOVED |
| 2 | 27 | 2.5 | GRUVLOK, SER.7800 CHECK VALVE, GRVD |
| 4 | 34 | 6 | GRUVLOK, FIG.7280 STRAINER, GROOVED |
| 2 | 55 | 10 | GRUVLOK, SER.7700 BUTTERFLY VALVE, GRVD |
| 12 | 58 | 6 | GRUVLOK, SER.7700 BUTTERFLY VALVE, GRVD |
| 1 | 61 | 10 | GRUVLOK, SER.7700 BUTTERFLY VALVE, GRVD |
| 4 | 81 | 6 | GRUVLOK, FIG.722G 3DTY VALVE, GROOVED |
| 2 | 85 | 6x5 | GRUVLOK, FIG.7250 SUCTION DIFF, GROOVED |
| 2 | 89 | 6 | GRUVLOK, FIG.7250 SUCTION DIFF, GROOVED |



D HOT WATER ISO
M-1 NO SCALE



C CONDENSER WATER ISO
M-1 NO SCALE

| COLOR CODES FOR PIPING | |
|------------------------|------------------------|
| Green | CONDENSER WATER SUPPLY |
| Blue | CONDENSER WATER RETURN |
| Light Blue | CHILLED WATER SUPPLY |
| Red | CHILLED WATER RETURN |
| Orange | HOT WATER SUPPLY |
| Yellow | HOT WATER RETURN |