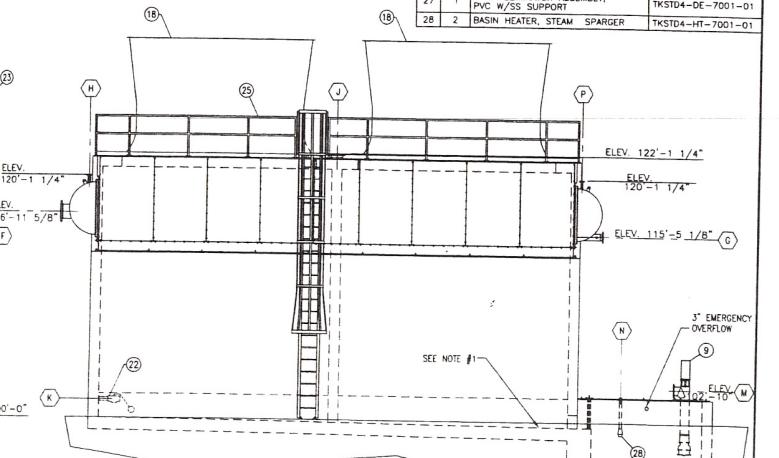
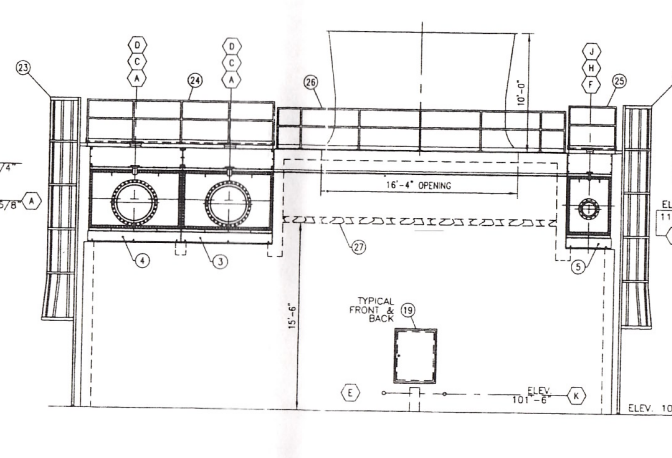
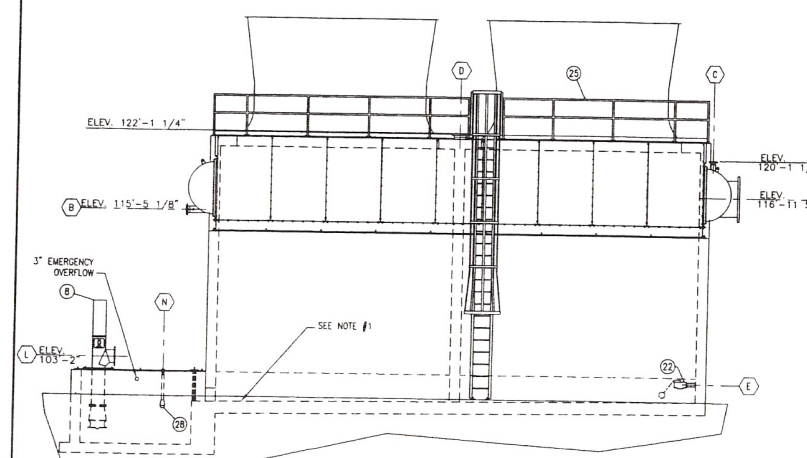


TUBE BUNDLE CONSTRUCTION DATA		PERFORMANCE DATA		BILL OF MATERIAL																																																																																																																					
CODE: ASME SECT VIII-1, LASTEST ADDENDA DESIGN PRESSURE: 25 PSIG/FE DESIGN TEMP: 250°F MDMT: -20°F HEAT TREATMENT: NONE NDE PER CODE TUBE MATERIAL: 304, 304L SS TUBESHEET MATERIAL: 304, 304L SS DOME COVER ASSEMBLY: 304L SS BUNDLE SIDE PANEL: 304, 304L SS TUBE SUPPORT SHEETS: 304, 304L SS		CONDENSER DESIGN: MAIN FLOWRATE: 45,342 #/HR INLET PRESSURE: 1.79 PSIA INLET TEMP: 122°F NCG OUTLET TEMP: 111°F DUTY: 46,335.032 BTU/HR PRESSURE DROP: 0.15 PS AMBIENT WET BULB TEMP: 71°F CONDENSER DESIGN: REGEN FLOWRATE VARIES INLET PRESSURE: 2 = 25 PSIA INLET TEMP: 192°F = 110°F NCG OUTLET TEMP: VARIES DUTY: VARIES PRESSURE DROP: VARIES AMBIENT WET BULB TEMP: 71°F		<table border="1"> <thead> <tr> <th>ITEM No.</th> <th>QTY./UNIT</th> <th>DESCRIPTION</th> <th>TK DRAWING No.</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>2</td> <td>TUBE BUNDLE, CLEANABLE, STRAIGHT TUBE, w/ REMOVABLE DOME COVERS (ALSO SEE CONSTRUCTION &amp; PERFORMANCE DATA)</td> <td>TKSTD2-BC-7001-01</td> </tr> <tr> <td>2</td> <td>1</td> <td>TUBE BUNDLE, CLEANABLE, STRAIGHT TUBE, w/ REMOVABLE DOME COVERS (ALSO SEE CONSTRUCTION &amp; 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DRAIN CONNECTIONS</td> <td>TKSTD3-GB-1001-01</td> </tr> <tr> <td>18</td> <td>2</td> <td>FAN STACK VELOCITY RECOVERY, FRP w/ ACCESS DOOR &amp; SS HARDWARE</td> <td>TKSTD3-FS-6001-01</td> </tr> <tr> <td>19</td> <td>2</td> <td>3' x 4' ACCESS DOOR</td> <td>TKSTD4-AD-7001-01</td> </tr> <tr> <td>20</td> <td>2</td> <td>PUMP PIT COVER ASSEMBLY w/ REMOVABLE STRAINER</td> <td>TKSTD4-PA-1003-01</td> </tr> <tr> <td>21</td> <td>2</td> <td>PUMP PIT COVER ASSEMBLY w/ REMOVABLE STRAINER</td> <td>TKSTD4-PA-1002-01</td> </tr> <tr> <td>22</td> <td>2</td> <td>VALVE, FLOAT, WATER MAKE-UP, 2" FPT INLET</td> <td>TKSTD3-FV-5001-01</td> </tr> <tr> <td>23</td> <td>2</td> <td>ACCESS LADDER</td> <td>TKSTD4-LD-6001-01</td> </tr> <tr> <td>24</td> <td>1</td> <td>ACCESS CATWALK</td> <td>TKSTD4-CW-6001-01</td> </tr> <tr> <td>25</td> <td>1</td> <td>ACCESS CATWALK</td> <td>TKSTD4-CW-6002-01</td> </tr> <tr> <td>26</td> <td>1</td> <td>ACCESS DECK HANDRAILS</td> <td>TKSTD2-HR-6002-01</td> </tr> <tr> <td>27</td> <td>1</td> <td>DRIFT ELIMINATOR ASSEMBLY, PVC w/SS SUPPORT</td> <td>TKSTD4-DE-7001-01</td> </tr> <tr> <td>28</td> <td>2</td> <td>Basin Heater, Steam Sparger</td> <td>TKSTD4-HT-7001-01</td> </tr> </tbody> </table>		ITEM No.	QTY./UNIT	DESCRIPTION	TK DRAWING No.	1	2	TUBE BUNDLE, CLEANABLE, STRAIGHT TUBE, w/ REMOVABLE DOME COVERS (ALSO SEE CONSTRUCTION & PERFORMANCE DATA)	TKSTD2-BC-7001-01	2	1	TUBE BUNDLE, CLEANABLE, STRAIGHT TUBE, w/ REMOVABLE DOME COVERS (ALSO SEE CONSTRUCTION & PERFORMANCE DATA)	TKSTD2-BC-7003-01	3	1	ADAPTER BASE, INBOARD TUBE BUNDLE, STRUCTURAL STEEL, HDGAF	TKSTD2-AB-1001-01	4	1	ADAPTER BASE, RH OUTBOARD TUBE BUNDLE, STRUCTURAL STEEL, HDGAF	TKSTD2-AB-1002-01	5	1	ADAPTER BASE, LH OUTBOARD TUBE BUNDLE, STRUCTURAL STEEL, HDGAF	TKSTD2-AB-1003-01	6	2	ASSEMBLY, PVC PIPE w/ LARGE ORIFICE REMOVABLE ABS NOZZLES	TKSTD2-SA-6001-01	7	1	ASSEMBLY, PVC PIPE w/ LARGE ORIFICE REMOVABLE ABS NOZZLES	TKSTD2-SA-6003-01	8	2	SPRAY PUMP, VERTICAL MIXED FLOW w/ 40 HP TEFC, HOLLOW SHAFT MOTOR (ALSO SEE PERFORMANCE DATA)	TKSTD3-SP-7002-01	9	2	SPRAY PUMP, VERTICAL MIXED FLOW w/ 15 HP TEFC, HOLLOW SHAFT MOTOR (ALSO SEE PERFORMANCE DATA)	TKSTD3-SP-7001-01	10	2	FAN, PROPELLER, 14" FT. # w/ (6) BLADES MANUALLY ADJUSTABLE PITCH (ALSO SEE PERFORMANCE DATA)	TKSTD3-FN-7001-01	11	2	GEAR DRIVE, RIGHT ANGLE, SINGLE REDUCTION w/ 65:1 RATIO, LOW OIL CUT OUT SWITCH INCLUDED	TKSTD3-GR-7001-01	12	2	ADAPTER BASE, GEAR DRIVE, STEEL, HDGAF	TKSTD2-GB-1001-01	13	2	DRIVE SHAFT, COMPOSITE w/ FLEXIBLE COUPLINGS	TKSTD3-DS-6001-01	14	2	GUARD, COUPLING, STEEL, HDGAF	TKSTD2-CG-2001-01	15	2	FAN MOTOR, 75 HP, TEFC (ALSO SEE PERFORMANCE DATA)	TKSTD3-FM-0001-01	16	2	ADAPTER BASE, FAN MOTOR, STEEL, HDGAF	TKSTD2-FB-1001-01	17	2	GEAR DRIVE EXTENDED LUBE LINE PIPING ASSEMBLY w/ LEVEL GAUGE, FILL & DRAIN CONNECTIONS	TKSTD3-GB-1001-01	18	2	FAN STACK VELOCITY RECOVERY, FRP w/ ACCESS DOOR & SS HARDWARE	TKSTD3-FS-6001-01	19	2	3' x 4' ACCESS DOOR	TKSTD4-AD-7001-01	20	2	PUMP PIT COVER ASSEMBLY w/ REMOVABLE STRAINER	TKSTD4-PA-1003-01	21	2	PUMP PIT COVER ASSEMBLY w/ REMOVABLE STRAINER	TKSTD4-PA-1002-01	22	2	VALVE, FLOAT, WATER MAKE-UP, 2" FPT INLET	TKSTD3-FV-5001-01	23	2	ACCESS LADDER	TKSTD4-LD-6001-01	24	1	ACCESS CATWALK	TKSTD4-CW-6001-01	25	1	ACCESS CATWALK	TKSTD4-CW-6002-01	26	1	ACCESS DECK HANDRAILS	TKSTD2-HR-6002-01	27	1	DRIFT ELIMINATOR ASSEMBLY, PVC w/SS SUPPORT	TKSTD4-DE-7001-01	28	2	Basin Heater, Steam Sparger	TKSTD4-HT-7001-01
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06018  
 CIE: ETHANOL  
 Canton, Illinois  
 03.27.07  
 File: 17.1 ET420  
 ET430



NOZZ. QTY.	SIZE	TYPE & RATING	PURPOSE
N	2	2" NPT	STEAM INLET
M	2	6" ASA/125#	MISCELLANEOUS CONNECTIONS DISCHARGE
L	2	12" ASA/125#	MISCELLANEOUS CONNECTIONS DISCHARGE
P	2	1.5" RFSO/150#	SPRAY PUMP CONNECTIONS Y-ENT
K	1	2" RFSO/150#	WATER MAKE UP
J	1	6" LAP JOINT/150#	SPRAY WATER INLET
H	1	2" LAP JOINT/150#	NCG OUTLET
G	1	6" LAP JOINT/150#	CONDENSATE OUTLET
F	1	14" LAP JOINT/150#	VAPOR INLET
E	1	2" RFSO/150#	BUNDLE ASSEMBLY NOZZLE SCHEDULE (REGEN ET-4301) WATER MAKE UP
D	2	10" LAP JOINT/150#	SPRAY WATER INLET
C	2	4" LAP JOINT/150#	NCG OUTLET
B	2	6" LAP JOINT/150#	CONDENSATE OUTLET
A	2	30" LAP JOINT/150#	VAPOR INLET

- NOTES
- 1) BASIN FLOOR TO FITCH 1/8"/FT TOWARDS PUMP PIT
  - 2) REFER TO CONCRETE BASIN DWG. No. 6018-SC-4302 THRU 4306 FOR ADDITIONAL DETAILS.
  - 3) FLANGE BOLTING TO STRADDLE NATURAL CENTERLINE.
  - 4) INSTALLATION OF COMPONENTS & INTERCONNECTING PIPING SHALL BE BY OTHERS. REFER TO PFD, P&ID AND INSTRUCTION MANUAL FOR ADDITIONAL DETAILS.

ISSUED FOR CONSTRUCTION

**CONFIDENTIAL**

DO NOT SCALE THIS DRAWING

**THERMAL KINETICS**  
 Engineering, PLLC & Systems, LLC  
 Evaporation/Distillation/Chemical Reaction/Process Design & Energy Conservation  
 667 Tift Street Buffalo, NY 14220

LPSI/CENTRAL ILLINOIS  
 CANTON, IL  
 ITEM ET-4204/ET-4301  
 TK MODEL 92/45-480-2/1-2F168

0	ISSUED FOR CONSTRUCTION	03/20/07	NCT	SCL	-
REV	REVISION	DATE	DESIGN	CHK	APP

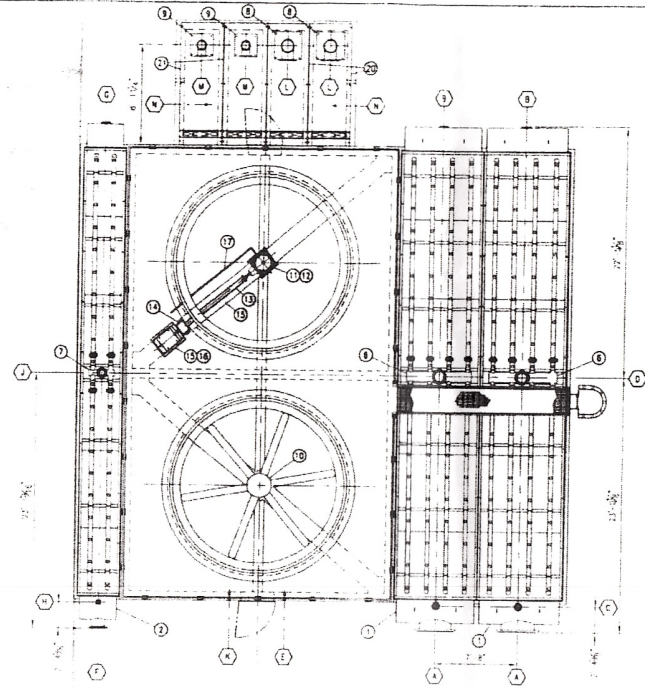
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 SCALE: 3/16" = 1'-0"  
 DRAWN BY: JC  
 CHECKED BY: SCL  
 DATE: 06/30/06  
 DATE: 08/30/06

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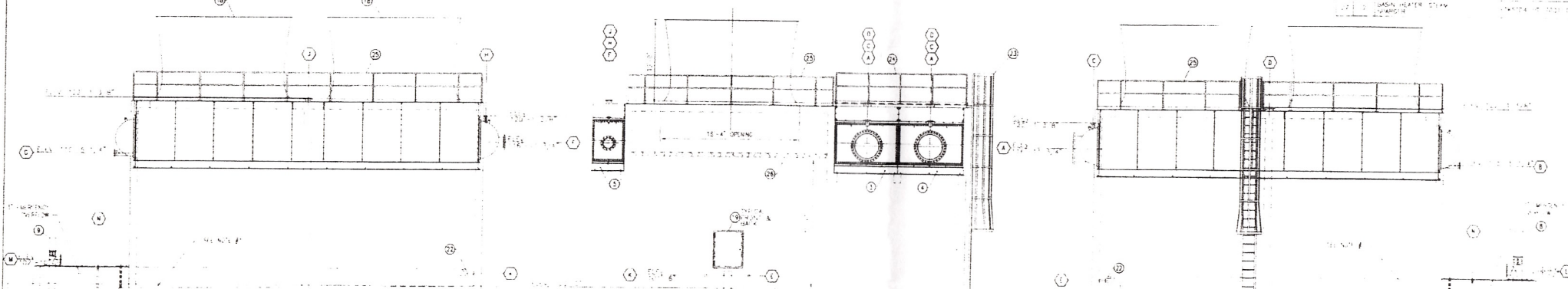
8/16/11  
 TK-0001  
 0

D-SIZE (24x36)

WHAT IS THIS FOR?  
 DWG. 73338-TK-0001 REA  
 SHOWS CORRECT ORIENTATIONS (I HOPE)  
*me*



TUBE BUNDLE CONSTRUCTION DATA		PERFORMANCE DATA		BILL OF MATERIAL	
ITEM NO.	DESCRIPTION	ITEM NO.	DESCRIPTION	ITEM NO.	DESCRIPTION
1	TUBE BUNDLE CLEANABLE STRAIGHT TUBE W/ REMOVABLE DOME COVERS (ALSO SEE CONSTRUCTION & PERFORMANCE DATA)	1	ADAPTER BASE INBOARD TUBE BUNDLE STRUCTURAL STEEL HDGAL	1	ADAPTER BASE INBOARD TUBE BUNDLE STRUCTURAL STEEL HDGAL
2	TUBE BUNDLE CLEANABLE STRAIGHT TUBE W/ REMOVABLE DOME COVERS (ALSO SEE CONSTRUCTION & PERFORMANCE DATA)	2	ADAPTER BASE IN OUTBOARD TUBE BUNDLE STRUCTURAL STEEL HDGAL	2	ADAPTER BASE IN OUTBOARD TUBE BUNDLE STRUCTURAL STEEL HDGAL
3	ADAPTER BASE INBOARD TUBE BUNDLE STRUCTURAL STEEL HDGAL	3	ADAPTER BASE IN OUTBOARD TUBE BUNDLE STRUCTURAL STEEL HDGAL	3	ADAPTER BASE IN OUTBOARD TUBE BUNDLE STRUCTURAL STEEL HDGAL
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6	ASSEMBLY PVC PIPE W/ LARGE ORifice REMOVABLE ABS NOZZLES	6	ASSEMBLY PVC PIPE W/ LARGE ORifice REMOVABLE ABS NOZZLES	6	ASSEMBLY PVC PIPE W/ LARGE ORifice REMOVABLE ABS NOZZLES
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8	SPRAY PUMP VERTICAL MIXED FLOW MOTOR (ALSO SEE PERFORMANCE DATA)	8	SPRAY PUMP VERTICAL MIXED FLOW MOTOR (ALSO SEE PERFORMANCE DATA)	8	SPRAY PUMP VERTICAL MIXED FLOW MOTOR (ALSO SEE PERFORMANCE DATA)
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10	FAN PROPELLER 14 FT #1 (60) BLADES MANUALLY ADJUSTABLE (ALSO SEE PERFORMANCE DATA)	10	FAN PROPELLER 14 FT #1 (60) BLADES MANUALLY ADJUSTABLE (ALSO SEE PERFORMANCE DATA)	10	FAN PROPELLER 14 FT #1 (60) BLADES MANUALLY ADJUSTABLE (ALSO SEE PERFORMANCE DATA)
11	GEAR DRIVE RIGHT ANGLE SINGLE REDUCTION W/ 6.5:1 RATIO LOW OIL CUT OUT SWITCHES	11	GEAR DRIVE RIGHT ANGLE SINGLE REDUCTION W/ 6.5:1 RATIO LOW OIL CUT OUT SWITCHES	11	GEAR DRIVE RIGHT ANGLE SINGLE REDUCTION W/ 6.5:1 RATIO LOW OIL CUT OUT SWITCHES
12	ADAPTER BASE GEAR DRIVE STEEL HDGAL	12	ADAPTER BASE GEAR DRIVE STEEL HDGAL	12	ADAPTER BASE GEAR DRIVE STEEL HDGAL
13	DRIVE SHAFT COMPOSITE W/ FLEXIBLE COUPLINGS	13	DRIVE SHAFT COMPOSITE W/ FLEXIBLE COUPLINGS	13	DRIVE SHAFT COMPOSITE W/ FLEXIBLE COUPLINGS
14	GEAR COUPLING STEEL HDGAL	14	GEAR COUPLING STEEL HDGAL	14	GEAR COUPLING STEEL HDGAL
15	FAN MOTOR 75 HP TEFC (ALSO SEE PERFORMANCE DATA)	15	FAN MOTOR 75 HP TEFC (ALSO SEE PERFORMANCE DATA)	15	FAN MOTOR 75 HP TEFC (ALSO SEE PERFORMANCE DATA)
16	ADAPTER BASE FAN MOTOR STEEL HDGAL	16	ADAPTER BASE FAN MOTOR STEEL HDGAL	16	ADAPTER BASE FAN MOTOR STEEL HDGAL
17	GEAR DRIVE EXTENDED TUBE LINE PIPING ASSEMBLY W/ LEAK GUAGE FILL & DRAIN CONNECTIONS	17	GEAR DRIVE EXTENDED TUBE LINE PIPING ASSEMBLY W/ LEAK GUAGE FILL & DRAIN CONNECTIONS	17	GEAR DRIVE EXTENDED TUBE LINE PIPING ASSEMBLY W/ LEAK GUAGE FILL & DRAIN CONNECTIONS
18	FAN STACK VELOCITY REDUCER W/ ACCESS DOOR & 53" HANGERS	18	FAN STACK VELOCITY REDUCER W/ ACCESS DOOR & 53" HANGERS	18	FAN STACK VELOCITY REDUCER W/ ACCESS DOOR & 53" HANGERS
19	3' x 4' ACCESS DOOR	19	3' x 4' ACCESS DOOR	19	3' x 4' ACCESS DOOR
20	PUMP PIT COVER ASSEMBLY W/ REMOVABLE STRAINER	20	PUMP PIT COVER ASSEMBLY W/ REMOVABLE STRAINER	20	PUMP PIT COVER ASSEMBLY W/ REMOVABLE STRAINER
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22	WATER TREATMENT WATER MAKE UP PIPING	22	WATER TREATMENT WATER MAKE UP PIPING	22	WATER TREATMENT WATER MAKE UP PIPING
23	ACCESS DOOR	23	ACCESS DOOR	23	ACCESS DOOR
24	ACCESS DOOR	24	ACCESS DOOR	24	ACCESS DOOR
25	ACCESS DOOR HANDRAILS	25	ACCESS DOOR HANDRAILS	25	ACCESS DOOR HANDRAILS
26	ACCESS DOOR HANDRAILS	26	ACCESS DOOR HANDRAILS	26	ACCESS DOOR HANDRAILS
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28	ACCESS DOOR HANDRAILS	28	ACCESS DOOR HANDRAILS	28	ACCESS DOOR HANDRAILS
29	ACCESS DOOR HANDRAILS	29	ACCESS DOOR HANDRAILS	29	ACCESS DOOR HANDRAILS
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NO.	DESCRIPTION	DATE	BY	CHKD BY
1	ISSUED FOR CONSTRUCTION	08/01/01	SC	SC
2	REVISION	08/01/01	SC	SC
3	REVISION	08/01/01	SC	SC
4	REVISION	08/01/01	SC	SC
5	REVISION	08/01/01	SC	SC
6	REVISION	08/01/01	SC	SC
7	REVISION	08/01/01	SC	SC
8	REVISION	08/01/01	SC	SC
9	REVISION	08/01/01	SC	SC
10	REVISION	08/01/01	SC	SC
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29	REVISION	08/01/01	SC	SC
30	REVISION	08/01/01	SC	SC

PRELIMINARY  
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**THERMAL KINETICS**  
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 567 Tift Street  
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REV	REVISION	DATE	BY	CHKD BY
1	ISSUED FOR CONSTRUCTION	08/01/01	SC	SC
2	REVISION	08/01/01	SC	SC
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