

NORTHWESTERN UNIVERSITY  
PROJECT NAME \_\_\_\_\_  
JOB # \_\_\_\_\_

FOR: \_\_\_\_\_  
ISSUED: 2022.2

SECTION 22 3400 FUEL FIRED, DOMESTIC WATER HEATERS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. D#%&' ( ) \$' \* ( + '#\$, - #./& )&. ' ) .0 12+ C. '1#\$31, &' 3,4\*&' ( " + '#\$, \$' \* S4--,+5+'1\$#6  
C. '\*&&. ' ) \$' \* D&/& )&. ' 0! S-+3&0&3\$1&. ' S+31&. ' ), \$-- ,6 1. 12& ) S+31&. ' .

1.2 SUMMARY

- A. S+31&. ' 1' 3,4\*+):

!. C. 5 5 + #3&\$, - . % + # 74# ' + #, ( \$ ) 0&# + \*, ) 1. # \$ ( +, \* . 5 ( D ) 34 ( , ) 0.356603 ( ) 0.356603 ( - ) - 11.3582 - E8TFUEL S

NORTHWESTERN UNIVERSITY

PROJECT NAME \_\_\_\_\_

JOB # \_\_\_\_\_

FOR: \_\_\_\_\_

ISSUED: 2022.2

B. ASHRAE:IESNA ;0.! C.5 -,\$'3+: F\$7#3\$1+ \$' \* , \$7+, 04+, 0#++ , \* .5+)13 %\$1+# 2+\$1+#) 1. 3.5 - ,6 %12 ASHRAE:IESNA ;0.!

C. ASME C.5 -,\$'3+:

- 1. W2++ ASME 3. \*+ 3. ' )1#431. ' & ) & ' \*3\$1+\* , 0\$7#3\$1+ \$' \* , \$7+, 3.5 5+#31\$, , \* .5+)13 %\$1+# 2+\$1+# )1. #\$(+ 1\$'@) 1. 3.5 - ,6 %12 ASME B. & ,+# \$' \* P#+)4## V+))+, C. \*+ : S+31. ' VIII, D&/& )& . ' !.
- 2. W2++ ASME 3. \*+ 3. ' )1#431. ' & ) & ' \*3\$1+\* , 0\$7#3\$1+ \$' \* , \$7+, 3.5 5+#31\$, , 0. ' '+ \* 147+, \* .5+)13 %\$1+# 2+\$1+# ) 1. 3.5 - ,6 %12 ASME B. & ,+# \$' \* P#+)4## V+))+, C. \*+ : S+31. ' IV.

D. NSF C.5 -,\$'3+ : F\$7#3\$1+ \$' \* , \$7+, +94- 5+'1 3.5 - . '+'1) 12\$1 %&, 7+ & ' 3. '1\$31 %12 - .1\$7,+ %\$1+# 1. 3.5 - ,6 %12 NSF A! , =D#&'@&' ( W\$1+# S6)1+5 C.5 - . '+'1) H+\$,12 E00+31).=

!B WARRANTY

A. S-+31\$, W\$##\$'16: M\$'40\$314##) )1\$' \*\$#\* 0.#5 & ' %2132 5\$'40\$314## \$(##+) 1. ##-\$# .# ##-,\$3+ 3.5 - . '+'1) .0 04+, 0#++ , \* .5+)13 %\$1+# 2+\$1+#) 12\$1 0\$, & ' 5\$1+#\$, ) .# % .#@5\$')2- %12&' ) -+300+\* %\$##\$'16 -+##. \*.

!. W\$##\$'16 P+#. \*): F#. 5 \*\$1+ .0 S47)1\$'1\$, C.5 - ,+1. '.

\$. C.5 5+#31\$, " \$) F##+\* , S1. #\$(+ , D. 5+)13 W\$1+# H+\$1+#):

- 1D S1. #\$(+ T\$'@: T2##+ 6+\$#).
- 2D C. '1# . , ) \$' \* O12+# C.5 - . '+'1): O' + 6+\$#E)D.
- 3D C.5 -#+)& . ' T\$'@): F&/+ 6+\$#).

PART 2 PRODUCTS

2.! COMMERCIAL, " AS FIRED, STORA " E, DOMESTIC WATER HEATERS

A. C.5 5+#31\$, P. %+# B4#'+, " \$) F##+\* , S1. #\$(+ , D. 5+)13 W\$1+# H+\$1+#):

!. B\$) & ) .0 D+) & (' P#. \*431: S47>+31 1. 3.5 - ,,\$'3+ %12 #+94##+5+'1), -#./&\*+ -#. \*431 & ' \*3\$1+\* . ' 12+ \*\$%&' ( ) .# 3.5 - \$7,+ -#. \*431 76 . '+' .0 12+ 0. . , . %&' (:

- \$. A. O. S5&12
- 7. L. 32&/\$#.
- 3. B#\$\*0. #\* W2&1+
- \*. N\$/&+'

- 2. S1\$' \*\$#\* : ANSI F2! .!0.3:CSA 4.3.
- 3. S1. #\$(+ T\$'@ C. ' )1#431. ' : ASME 3. \*+ )1++ , %12 !B0 - )& ( % .#@&' ( -#+)4## #1&' (.

\$. T\$ - -&' ( ): F\$31. #6 0\$7#3\$1+\* .0 5\$1+#\$, ) 3.5 - \$17,+ %12 1\$'@. A11\$32 1\$ - -&' ( ) 1. 1\$'@ 7+0. #+ 1+)1&' (.

!D T2##+\$\*+ + '\* ) \$33. #\*&' ( 1. ASME B! .20.!

NORTHWESTERN UNIVERSITY

PROJECT NAME \_\_\_\_\_

JOB # \_\_\_\_\_

FOR: \_\_\_\_\_

ISSUED: 2022.2

- 7. I'1+#. # F&'&2: C. 5 -,6 %&12 NSF A! 7\$###+# 5\$1+#\$,) 0.# - .1\$7,+ %\$1+# 1\$' @ ,&'&' ( ), &'3,4\*&' ( +G1+ '\*&' ( 0&'&)2 &'1. \$' \* 12#. 4(2 1\$' @ 0&11&' ( ) \$' \* .41,+1).
- 3. L&'&' ( : " , \$ ) 3. 5 -,6&' ( %&12 NSF A! 7\$###+# 5\$1+#\$,) 0.# - .1\$7,+ %\$1+# 1\$' @ ,&'&' ( ), &'3,4\*&' ( +G1+ '\*&' ( ,&'&' ( &'1. \$' \* 12#. 4(2 1\$' @ 0&11&' ( ) \$' \* .41,+1).

4. F\$3l.#6 l' )1\$,+\* Sl.#\$(+ T\$' @ A--4#1+'\$'3+):

\$. A' . \*+ R. \*: R+-, \$3+\$7,+ 5\$ ( ' + ) &45.

7.SF D&- T47+: R+94#++\* 4',+)) 3., \* %\$1+# &' ,+1 & ) ' +\$# 7.11. 5 .0 1\$' @.

7925775 ( .3583 ( , ) 4356603 ( S ) 311.8845 ( + ) - E00129 ( \$ ) 0.713207 ( ' ) 0.7149 ( & ) 4.71247 ( .124735 ) 071207 ( )

- \$. T\$- -&' ( ): F\$31.#6 0\$7#3\$1+\* )1+, , %+, \*+\* 1. 1\$' @ 7+0.#+ 1+)1&' ( \$' \* , \$7+, &' ( . I'3,4\*+ ASME B! .20.! -&-+ 12#+\$\* .
- 7. I'1+#&. # F&' & )2: C. 5 - ,6 %&12 NSF A! 7\$##&+# 5\$1+#&\$, ) 0.# - . 1\$7,+ %\$1+# 1\$' @ , &' &' ( ) , &' 3,4\* &' ( +G1+ ' \* &' ( 0&' & ) 2 &' 1. \$' \* 12#. 4 ( 2 1\$' @ 0&11&' ( ) \$' \* . 41,+1).
- 3. A&# C2\$#( &' ( V\$, /+ : F\$31.#6 &' ) 1\$, +\* .

4. C\$- \$3&16 \$' \* C2\$# \$31+#& )1&3):


- \$. W.#@&' ( P#+) 4#+ R\$1&' ( : !B0 - ) &' ( .
- 7. C\$- \$3&16 A33+- 1\$7,+ : !0 ( \$, . 5&' & 545.

- B. P&- &' ( T6-+ H+\$1 T#\$-): F&+, \* 0\$7#&3\$1+\* -&- &' ( \$\$\$' ( +5+' 1 \$33.#\* &' ( 1. ASHRAE:IESNA ; 0.!
- C. H+\$1 T#\$- F&11&' ( ): ASHRAE ; 0.2.
- D. " \$) S241.00 V\$, /+): ANSI F2! .! B:CSA ; ! M, 5\$' 4\$, 6 . - +\$1+\* . F4# ' & ) 2 0.# &' ) 1\$, , \$1&. ' &' -&- &' ( .
- E. " \$) P#+) 4#+ R+( 4, \$1.#): ANSI F2! .! I:CSA A.3, \$- , - , \$' 3+ 16-+ . I'3,4\*+ %&12 -#+) 4#+ # \$1&' ( \$) ##+94&#+\* 1. 5\$132 ( \$) ) 4-- , 6.
- F. A41. 5\$1&3 " \$) V\$, /+): ANSI F2! . 2! :CSA A.B, \$- , - , \$' 3+, +, +31#&3\$, 6 . - +\$1+\* , . ' . 00 \$41. 5\$1&3 /\$, /+.
- ". C. 57&' \$1&. ' T+5 - +\$14#+ \$' \* P#+) 4#+ R+, &+0 V\$, /+): I'3,4\*+ #+, &+ / &' ( 3\$- \$3&16 \$1 , +\$) 1 \$) (#+\$1 \$) 2+\$1 &' -41, \$' \* &' 3,4\*+ -#+) 4#+ ) +11&' ( , +) ) 12\$' \* . 5+) 1&3 %\$1+# 2+\$1+# % . #&' ( -#+) 4#+ # \$1&' ( . S+, +31 #+, &+0 /\$, /+ ) %&12 ) + ' &' ( +, +5+' 1 12\$1 +G1+' \* ) &' 1. ) 1.# \$ ( + 1\$' @ .
- !. " \$) F&#+\* , D. 5+) 1&3 W\$1+# H+\$1+#): ANSI F2! . 22:CSA 4.4 M.

2.3 SOURCE ?UALITY CONTROL

- A. F\$31.#6 T+) 1): T+) 1 \$' \* &' ) - +31 \$) ) +57,+\* \* . 5+) 1&3 %\$1+# 2+\$1+# \$' \* ) 1.# \$ ( + 1\$' @ ) - +3&0&+\* 1. 7+ ASME 3. \* + 3. ' ) 1#431&. ' , \$33.#\* &' ( 1. ASME B. &, +\$' \* P#+) 4#+ V+) , C. \*+.
- B. H6\*# . ) 1\$1&3\$, 6 1+) 1 3. 5 5 + #3&\$, \* . 5+) 1&3 %\$1+# 2+\$1+# \$' \* ) 1.# \$ ( + 1\$' @ ) 1. 5&' & 545 . 0 . . '+ \$' \* . ' + 2\$, 0 1&5+ ) -#+) 4#+ # \$1&' ( 7+0.#+ ) 2&- 5+' 1.
- C. D. 5+) 1&3 %\$1+# 2+\$1+# ) %&, 7+ 3. ' ) &\* + # + \* \* +031&/+ & 0 12+6 \* . ' . 1 - \$) ) 1+) 1) \$' \* &' ) - +31&. ' ) . C. 5 - , 6 %&12 #+94&#+5+' 1) &' D&/& ) &. ' 0! S+31&. ' = ?4\$, &16 R+94&#+5+' 1) = 0.# #+1+) 1&' ( \$' \* .

NORTHWESTERN UNIVERSITY  
PROJECT NAME \_\_\_\_\_  
JOB # \_\_\_\_\_

FOR: \_\_\_\_\_  


3.2 CONNECTIONS

- A. C. 5 - ,6 %12 #+94##+5+'1) 0.# \* . 5+)13 %\$1+# -&-&' ( ) -+300+\* &' D&/&). ' 22 S+31&. ' =D. 5+)13 W\$1+# P&-&' (.=
- B. C. 5 - ,6 %12 #+94##+5+'1) 0.# (\$) -&-&' ( ) -+300+\* &' D&/&). ' 23 S+31&. ' =F\$3&,16 N\$14#\$, " \$) P&-&' (.=
- C. D#\$%&' ( ) &' \*13\$1+ ( +' +#\$, \$##\$' (+5+'1 .0 -&-&' ( , 0&11&' ( ) , \$ ' \* ) -+3&\$,1&+).
- D. W2+##+ &' )1\$,&' ( -&-&' ( \$\*>\$3+'1 1. 04+, 0&##+\*, \* . 5+)13 %\$1+# 2+\$1+#), \$,,.% )-\$3+ 0.# )+##/13+ \$ ' \* 5&'1+' \$'3+ .0 %\$1+# 2+\$1+#). A##\$' ( + -&-&' ( 0.# +\$)6 #+5 ./\$, .0 \* . 5+)13 %\$1+# 2+\$1+#).

3.3 IDENTIFICATION

- A. I\*+'1806 )6)1+5 3.5 - . '+'1). C. 5 - ,6 %12 #+94##+5+'1) 0.# &\*+'180&3\$1&. ' ) -+300+\* &' D&/&). ' 22 S+31&. ' =I\*+'180&3\$1&. ' 0.# P,457&' ( P&-&' ( \$ ' \* E94&- 5+'1.=

3.4 FIELD ?UALITY CONTROL

- A. P+#0.#5 1+)1) \$ ' \* &' ) -+31&. ' ).
- !. M\$'40\$314#++#() F&+,\* S+##/13+: E' (\$ (+ \$ 0\$31.#6 \$412.#18+\* )+##/13+ #+-#+)+'1\$1&/+ 1. &' ) -+31 3. 5 - . '+'1), \$)) +57,&+), \$ ' \* +94&- 5+'1 &' )1\$,,\$1&. ' ), &' 3,4\* &' ( 3. ' '+31&. ' ), \$ ' \*