



EFFICIENCY
PRODUCTION, INC.

P.O. BOX 24126 LANSING, MI 48903
PHONE 517-676-8800

EFFICIENT
TRENCH SHIELD

MODEL

420 XLDF

SERIAL NUMBER

116064

REFERENCE TO OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION RULES AND
REGULATIONS, VOL. 54, NO. 209, 10-31-89, PART 1926, SUBPART P

SHIELD SIZE

PSF RATING

MAXIMUM ALLOWABLE DEPTH OF CUT (FEET)
D

SOIL TYPE TO BE EXCAVATED

HEIGHT
(FEET)

LENGTH
(FEET)

MAXIMUM LATERAL
EARTH PRESSURE
CAPACITY AT
TRENCH BOTTOM
IN POUNDS PER
SQUARE FOOT

TYPE A
Stiff, cohesive soil.
25 PSF per
foot of depth.

TYPE B
Medium cohesive to
granular soil.
45 PSF per foot
of depth.

TYPE C
Soft cohesive to
submerged soil.
60 PSF per foot
of depth.

4

20

1050

42

23

18

LIMITATIONS IN USE OF TABLE

1. TRENCH SHIELD TO BE ASSEMBLED AND INSTALLED AS SHOWN AND IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
2. EXCAVATION 2 FEET BELOW BOTTOM OF SHIELD IS PERMITTED WHEN NO LOSS OF SOIL FROM BEHIND OR BELOW THE BOTTOM OF SHIELD IS ENCOUNTERED.
3. CONSULT MANUFACTURER WHEN RESTRICTION OF NOTE 2 IS NOT MET.
4. ADDITIONAL SHIELDS MAY BE STACKED WITH NO PENALTY IN DEPTH OF CUT.
5. DEPTHS OF CUTS SHOWN ARE BASED ON EXAMPLES OF VARIOUS SOIL CONDITIONS. VERIFY ACTUAL SOIL PRESSURES PRIOR TO EACH USE.
6. ANY MODIFICATIONS OR ALTERATIONS NOT ALLOWED UNLESS APPROVED IN WRITING BY EFFICIENCY PRODUCTION, INC.
7. DEPTH CERTIFICATION IS BASED ON SHORT TERM EXPOSURE WITH EXCAVATION OPEN A PERIOD OF TIME EQUAL TO 24 HOURS OR LESS. CONSULT THE MANUFACTURER SHOULD LONG TERM EXPOSURE BE REQUIRED.

DESCRIPTION

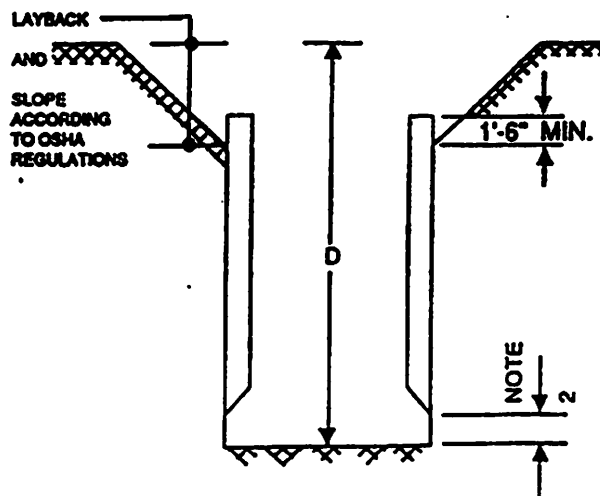
Clay, silty clay, sandy clay, clay loam, unconfined compressive strength of 1.5 tons per square foot or greater. (See note 8 on reverse side).

DESCRIPTION

Clay with unconfined compressive strength greater than .5 TSF but less than 1.5 TSF. cohesionless gravel, silt, silt loam or sandy loam. (See Note 9 on reverse side).

DESCRIPTION

Clay with unconfined compressive strength less than .5 TSF, submerged sand, clay or fractured rock that is not stable. (See Note 10 on reverse side).



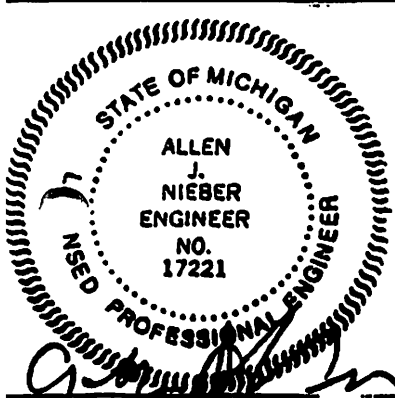
CERTIFIED BY:

McCLURG & ASSOCIATES, INC. CONSULTING ENGINEERS

EFFICIENCY PRODUCTION, INC.
ALL RIGHTS RESERVED

MANUFACTURED UNDER ONE OR MORE OF THE FOLLOWING U.S. PATENT NUMBERS:
4,090,365-4,114,383-4,259,028
ONE OR MORE OF THE FOLLOWING CANADIAN PATENT NUMBERS: 1,062,683-1,062,684

USE THIS PRODUCT ONLY IN ACCORDANCE WITH
APPLICABLE FEDERAL, STATE, OR LOCAL LAWS

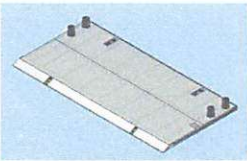


Any use of this product not specifically described on this certificate could cause cave-in, collapse.

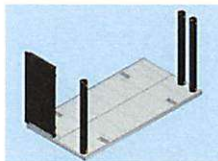
- NOT TYPE A IF FISSURED, SUBJECT TO VIBRATION, PREVIOUSLY DISTURBED OR PART OF A SLOPED LAYERED SYSTEM WHERE LAYERS DIP INTO EXCAVATION ON A SLOPE OF FOUR HORIZONTAL TO ONE VERTICAL (4H:1V) OR GREATER.
- PREVIOUSLY DISTURBED SOILS MAY BE TYPE B UNLESS THEY WOULD BE CLASSIFIED AS TYPE C. SOIL THAT MEETS THE REQUIREMENTS OF TYPE A, BUT IT IS SUBJECT TO VIBRATION OR FISSURED MAY BE TYPE B. DRY ROCK THAT IS NOT STABLE OR SOIL THAT IS PART OF A SLOPED, LAYERED SYSTEM WHERE LAYERS DIP INTO THE EXCAVATION ON A SLOPE LESS STEEP THAN FOUR HORIZONTAL TO ONE VERTICAL (4H:1V) ARE TYPE B BUT ONLY IF MATERIAL WOULD OTHERWISE BE CLASSIFIED AS TYPE B.
- SOIL IN A SLOPED LAYERED SYSTEM WHERE LAYERS DIP INTO THE EXCAVATION ON A SLOPE OF FOUR HORIZONTAL TO ONE VERTICAL (4H:1V) OR STEEPER MAY BE TYPE C. SUBMERGED SOIL IS MATERIAL WITH WATER FREELY SEEPING AND ENTERING THE TRENCH, BUT ONLY PART OF THE DEPTH OF THE RETAINED SOIL IS SUBMERGED. CONDITIONS MORE SEVERE WOULD REQUIRE DEWATERING OR SEALING FOUR SIDES OF THE EXCAVATION AND PUMPING THE TRENCH, SUCH SEVERE CONDITIONS WOULD REQUIRE THE SERVICES OF A LICENSED GEOTECHNICAL ENGINEER TO ESTABLISH THE DESIGN PRESSURE. CONSULT THE MANUFACTURER FOR PRESSURES EXCEEDING TABULATED VALUES.
- ANY SOIL THAT WILL STAND UNSUPPORTED LONG ENOUGH TO INSTALL TRENCH SHIELD MAY BE CLASSIFIED AS C-60
- ANY USE OF A TRENCH SHIELD WITHOUT EFFICIENCY SPREADERS AND PINS OR EQUAL WILL VOID THE TABULATED DATA AND WARRANTY.
- SHIELD WAS DESIGNED TO BE USED WITHOUT PLATES EXTENDING BELOW, ABOVE, OR NEXT TO IT. ANY USE OF SUCH PLATES OR PANELS MAY VOID THE TABULATED DATA AND MAY REQUIRE SITE SPECIFIC ENGINEERING PREPARED BY A LICENSED PROFESSIONAL ENGINEER.
- TRENCH SHIELDS ARE DESIGNED TO BE PUSHED TO GRADE IF NECESSARY. AS NOTED BELOW, ANY UNNECESSARY ABUSE BY THE EXCAVATOR AND OR OPERATOR (SUCH AS POUNDING WITH THE BUCKET) WILL VOID THE TABULATED DATA AS WELL AS THE WARRANTY.
- CONDITION OF SHIELD, SPREADER PIPES, AND SPREADER PINS MUST BE CHECKED/ INSPECTED FOR SERVICEABILITY BY THE COMPETENT PERSON PRIOR TO EACH USE. PSF RATING IS NOT VALID IF THERE IS ANY VISIBLE DAMAGE TO, OR REPAIRS MADE TO THE SHIELD THAT HAS NOT BEEN DOCUMENTED AND CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER.
- A MINIMUM OF 2 SPREADERS, 1 ARCH, OR 1 SPREADER AND 1 MUDPLATE MUST BE INSTALLED ON EACH END OF TRENCH SHIELD PRIOR TO USE.
- DEPTH AND PSF RATING ARE FOR LATERAL EARTH PRESSURES ONLY. AN ADDITIONAL LATERAL SURCHARGE PRESSURE UP TO 72PSF IS ALLOWED

ASSEMBLY (DIS-ASSEMBLE SHIELD IN REVERSE ORDER)

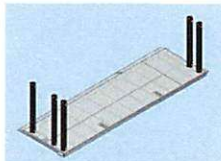
MUDPLATE SPREADERS SYSTEM 5 PIPE SPREADER SYSTEM



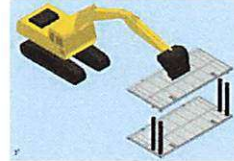
LAY SIDE PANEL FLAT ON GROUND WITH COLLAR SOCKETS UP



PLACE SPREADER PIPE AND/OR PLATE ON TO COLLARS OR INTO BRACKETS AND PIN IN PLACE. SECURE PINS WITH KEEPERS



4 PIPE SPREADER SYSTEM



LOWER SECOND SIDEWALL ONTO SPREADERS AND PIN

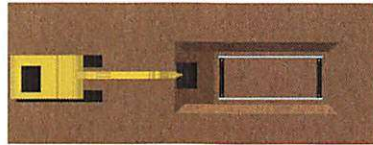


STAND TRENCH SHIELD IN UPRIGHT POSITION AND PREPARE FOR INSTALLATION

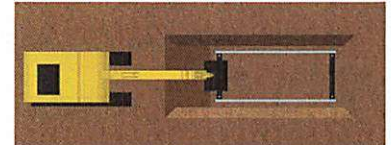
USING A TRENCH SHIELD IN STABLE SOIL



EXCAVATE TO GRADE JUST SLIGHTLY WIDER THAN THE TRENCH SHIELD. DIG WALLS VERTICAL TO MINIMUM OF 18" BELOW THE TOP OF THE SHIELD. SLOPE SOILS ABOVE SHIELD ACCORDING TO MANUFACTURERS TABULATED DATA. INSTALL SHIELD IN TRENCH.

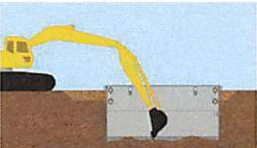


EXCAVATE IN FRONT OF THE TRENCH SHIELD

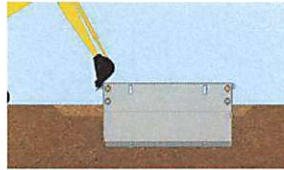


PULL SHIELD FORWARD BY FRONT TOP SPREADER PIPE OR WITH PULLING EYES. (PULLING EYES SHALL BE USED WITH SPREADERS WIDER THAN 72" OR WHEN SOIL PRESSURE IS SEVERE ENOUGH TO CAUSE SPREADER TO DEFLECT).

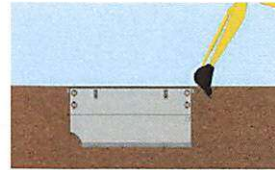
USING A TRENCH SHIELD IN UNSTABLE SOIL



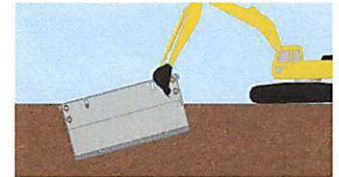
EXCAVATE UNTIL SOIL BEGINS TO CRUMBLE BEYOND DESIRED TRENCH WIDTH. PLACE SHIELD IN LINE OF EXCAVATION



PRESS DOWN ON CORNERS TO PUSH SHIELD DOWN TO GRADE



PULL SHIELD FORWARD AND UP ON APPROPRIATE ANGLE



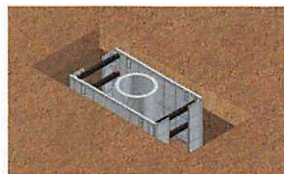
EXCAVATE SOIL WITHIN THE SHIELD AND REPEAT PREVIOUS PROCESS

USING TRENCH SHIELDS FOR PATCHWORK, REPAIRS OR TIE-INS



*CENTER SHIELD OVER WORK AREA
*LAY SOIL AT ENDS BACK ACCORDING TO MANUFACTURER'S TABULATED DATA OR USE MANUFACTURER'S DESIGNED PLATES TO PROTECT FROM CAVE-INS

MANHOLE BOX W/CORNER END PLATES



CORNER END PLATES HELP PREVENT LOOSE MATERIAL FROM RUNNING INTO THE END OF THE SHIELD. SOIL AT ENDS SHOULD BE SLOPED ACCORDING TO MANUFACTURER'S TABULATED DATA

USING 4-SIDED SHIELDS



WHEN USING SHIELDS AS PROTECTION DURING MANHOLE ASSEMBLY WORK, INSURE THAT PROPER END PANELS ARE USED, OR LAY SOIL AT THE ENDS BACK ACCORDING TO MANUFACTURER'S TABULATED DATA