DIVISION 07 - Thermal and Moisture Protection

Preface

The Texas Tech University System's 'Design and Construction Standards', as administrated by Facilities Planning and Construction, are intended to serve as guidelines to the esign Pro!essional and Construction " anagement teams !or design develo#ment and construction administration o! Texas Tech University System $TTUS% Ca#ital Pro&ects' They communicate the minimum ex#ectations and re(uirements relative to s#eci!ic building systems, design #rovisions, general s#eci!ication re(uirements, and administrative #rocedures !or ne) !acilities being constructed on Texas Tech University System $*SU, " SU, TTU, TTU+SC, and TTU+SC ,l Paso% cam#uses' Several, but not all re(uirements !or each com#onent -nstitution or *gency)ithin the TTU System are covered' esign Pro!essionals, Construction " anagers at .is/ and0or esign12uild Firms shall also re!er to #rovisions covered in their service *greements, as)ell as)ithin the #ro&ect's 2asis o! esign $23 % document'

-n addition, the ' esign and Construction Standards' shall also be utili4ed in con&unction)ith the a##roved #ro&ect s#eci!ic Program and Schematic esign develo#ment' -n the event o! con!lict bet)een this document and s#eci!ic #ro&ect re(uirements, esign Pro!essionals, Construction " anagers at .is/ and0or esign12uild Firms shall contact Facilities Planning 5 Construction !or clari!ication'

The guidelines)ithin the 'Design and Construction Standards' are not intended to #rohibit the use o! alternative design solutions, methods, systems, #roducts or devices not covered in this document' 3!!ered alternatives deviating !rom or not covered in these standards shall be

minimum (uality re(uirements' esign Pro!essionals are encouraged to identi!y and include e(uivalent #roducts and0or manu!acturers o!!ering com#arable #roducts to !acilitate o#en bidding environments'

General Requirements for Thermal & Moisture Protection

Contractors shall have a minimum o! !ive $7% years’

#rovides all the roo!ing1related in!ormation !rom the *##roval >uide and related installation recommendations !rom relevant F" >lobal Pro#erty @oss Prevention ata Sheets' . oo!ing systems not listed, must be a##roved by FP5C esign Team and F" >lobal'

The roo!ing Contractor shall submit the F" >lobal :Chec/list !or . oo!ing System< sheet)ith material submittals'

The design o! all roo! !lashing com#onents should be in accordance)ith the FM Global Pro ert**!** **"**oss Pre**#**ention Data Sheet **$**-**%&** Perimeter Flashin**'** re(uirements'

*'( )))**** **+**ituminous **,**am***!!*roofin**"**

Sur!aces o! exterior)alls $i! a##licable% and)alls belo) grade,)hich)ill receive an a##lied !inish, shall be #rimed, and coated)ith bituminous)ater#roo!ing #rior to installation o! !urring' Proceed)ith a##lication only a!ter substrate construction and #enetrating)or/ have been com#leted and unsatis!actory conditions have been corrected' Test !or sur!ace moisture

Submit manu!acturer-s standard) arranty !orm in) hich manu!acturer agrees to re#lace) ater#roo!ing material that does not com#ly) ith re(uirements or that !ails to remain) atertight

'(-) '' Thermal Insulation

*t a minimum, all s#eci!ied insulation #roducts must meet the re(uirements o! the -nternational 2uilding Code, *ha ter +, Plastic $a##ly multi1story building re(uirements only%, the -nternational , nergy Conservation Code $Table CAD6'1'? I Climate Jone ?2%, the State , nergy Conservation 3!!ice $S , C3% esign Standards, the ; ational Fire Protection *gency, and F" >lobal *##rovals $F" ACCD I Class 1%, s#eci!ically, but not limited to, FM Pro ert! "oss Pre#ention Data Sheet $-$+ *eilin's and *oncealed S aces-

Thermal insulation !or continuous and batt a##lications are covered)ithin this section' Protect insulation materials !rom #hysical damage and !rom deterioration due to moisture, soiling, and other so 9 .08 Tdc[(or)6.2881(n)0.5902 2(T)u6.2881(n)0.5902 2t

thic/er over smooth, void1!ree substrates'

" aterials and installation to bridge and seal the !ollo)ing air lea/age #ath)ays and ga#s)ill include, but not be limited to the !ollo)ingE

1' Connections o! the)alls to the roo! air barrier'
6' Connections o! the)alls to the !oundations'
?' ,x#ansion &oints'
A' 3#enings and #enetrations o!)indo) !rames, store !ront, curtain)all'
7' 2arrier #recast concrete and other envelo#e systems'
B' oor !rames'
8' Pi#ing, conduit, duct and similar #enetrations'
C' " asonry ties, scre)s, bolts and similar #enetrations'
G' *ll other air lea/age #ath)ays in the building envelo#e'
1D' Sealing !lashing to)all sur!ace'

Provide an air barrier system constructed to #er!orm as a continuous elastic air barrier, and as a li(uid)ater drainage #lane !lashed to discharge to the exterior any incidental condensation or)ater #enetration'

" embrane shall accommodate movements o! building materials by #roviding ex#ansion and control &oints as re(uired,)ith accessory air seal

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. oo! slo#eE ; e) construction minimum 10AR #er !oot in any directionF this includes cross1slo#es and cric/ets' . e1roo! minimum -2C 10AR slo#e not re(uiredF 4ero slo#e variance'

-nsulationE " inimum 61layer a##lication) ith all &oints staggered minimum 16RF sho) material ty#es and thic/nesses in S#eci!ications'

*ll vertical !lashing seams shall be hot air) elded and become #art o! manu!acturer- elt!3 3n9 1 3 t

The CT , " shall meet the !ollo) ing #hysical #ro#erties , longation 18DN, *ST " A16 Tensile Strength 17DD lbs0in^6, *ST " A16 Tear Strength ??D ##i, *ST " B6A ensity S 8DT F, CD lbs0!t? @o) Tem#erature Flexibility, Pass, ?81>P17B " and 9 ater *bsor#tion less than D'1N, ?81>P17B " '

2ase !lashing shall be same material as the coal1tar elastomeric !inish membrane $CT , " % and be installed using the design #rinci#les set !orth in the ; ational . oo!ing Contractors *ssociation " anual and details included in S#eci!ications'

Felts shall be Under) riters @aboratory a##roved and listed in the F " >lobal *##roval >uide and shall be Ty#e -H !iberglass #ly sheet, Under) riters @aboratory Ty#e >11, meeting Federal S#eci!ication ; o' SS1 . 1B6D2, *ST " 618C, Ty#e ---, as manu!actured by Uohns1 " anville, or a##roved e(ual'

2itumen shall meet *ST " 1?16, Ty#e -H extra stee# as#halt'

-nsulation shall meet - , C re(uirements' First layer to be rigid closed cell #olyisocyanurate long term thermal resistant . 1value, F " Class - !ire ha4ard classi!ication, U@ classi!ied !or installation) ith Class * roo! covering' Second layer to be rigid !iberboard, U@ classi!ied !or installation) ith Class * roo! covering' Provide additional !actory1ta#ered boards $minimum 106R #er !oot slo#e% !or cric/ets as sho) n on roo! #lan'

Proceed) ith installation only) hen existing and !orecasted) eather conditions #ermit roo!ing system to be installed according to manu!acturer-s) ritten instructions and) arranty re(uirements'

S#eci!y membrane roo!ing system that is identical to systems that have been success!ully tested by a (uali!ied testing and ins#ecting agency to resist u#li!t #ressure calculated according to *SC , 0S , - 8'

1' Corner U#li!t Pressure Per F " >lobal . e(uirements'
6' Perimeter U#li!t Pressure Per F " >lobal . e(uirements'
?' Field1o!1 . oo! U#li!t Pressure Per F " >lobal . e(uirements'

S#eci!y membrane roo!ing, base !lashings, and com#onent materials that com#ly) ith re(uirements in F " *##rovals AA7D and F " *##rovals AA8D as #art o! a membrane roo!ing

system, and that are listed in F " *##rovals= R . oo! ; avR !or Class 1 or noncombustible construction, as a##licable'

Identif! materials 3ith FM 5 ro#al mar2in's-

1' Fire0 9 indstorm Classi!icationE Per F " >lobal . e(uirements
6' +ail . esistanceE S+ $Severe +ail% or HS+ $Hery Severe +ail% determined by #ro&ect location #er F " ata Sheet 11?A +ail amage'

re(uest'

S#eci!y (uali!ied manu!acturers)ith systems that are U@ listed and F" *##roved !or membrane roo!ing systems'

Prior to startin' 3or2ß the roofin' contractor shall submit the follo3in' minimum items)

1' * sam#le o! the manu!acturer's "embrane System 9arranty'

6' Submit a letter o! certi!ication !rom the manu!acturer)hich certi!ies the roo!ing contractor is authori4ed to install the manu!acturer's roo!ing system and list !oremen)ho have received training !rom the manu!acturer along)ith the dates training)as received'

?' Certi!ication o! the manu!acturer's)arranty reserve'

A' Com#leted F" >lobal :Chec/list !or .oo!ing System< !orm'

7' Com#leted F" >lobal .oo! ;av !orm'

U#on com#letion o! the installed 9or/, submit co#ies o! the manu!acturer's !inal)arranty to the o)ner #rior to the issuance o! !inal #ayment'

Provide a minimum manu!acturer's total System 17 Vear ; @)arranty $6D Vear #re!erred% on manu!acturer-s standard or customi4ed !orm, covering both labor and materials)ithout monetary limitation, in)hich manu!acturer agrees to re#air or re#lace com#onents o! membrane roo!ing system that !ail in materials or)or/manshi#)ithin s#eci!ied)arranty #eriod'

9arranty includes membrane roo!ing, bac7 9 matro1ß(i)94 6 1 9d2c9 1((9))-53 1 46507(s-4 2 6d2(a)h or ag h 5 8 h 5 8 6(m)a1 .

'(.- '' Sheet Metal Flashin" and Trim

Sheet metal !lashing and trim assemblies as indicat

1' ; on1#atinated , x#osed FinishE " ill'

" etallic1coated steel sheet to beE . estricted !latness steel sheet, metallic coated by the hot1di# #rocess and #re1#ainted by the coil1coating #rocess to com#ly) ith *ST " * 8770* 877 " '

1' Jinc1Coated $>alvani4ed% Steel SheetE *ST " * B7?0* B7? ", >GD coating designationF structural (uality'
6' Sur!aceE Smooth, !lat'
?' , x#osed Coil1Coated FinishE
a' T) o1Coat Fluoro#olymerE * * " * B61' Fluoro#olymer !inish containing not less than 8D #ercent PH F resin by) eight in color coat' Pre#are, #retreat, and a##ly coating to ex#osed metal sur!aces to com#ly) ith coating and resin manu!acturers-) ritten instructions'
A' ColorE *s selected by *rchitect !rom manu!acturer-s !ull range, including metallic coatings'
7' Concealed FinishE Pretreat) ith manu!acturer-s standard) hite or light1colored acrylic or #olyester bac/er !inish, consisting o! #rime coat and) ash coat) ith a minimum total dry !ilm thic/ness o! D'7 mil'

Fabricate hanging gutters to cross sectionrosrtt

?' @ea! ScreenE -! s#eci!ied, #rovide continuous re

#erimeter gas/eting, ste##ed integral metal cant raised the thic/ness o! roo! insulation, and integrally !ormed dec/1mounting !lange at #erimeter bottom' . oo! hatches to be single lea! lid, ?B<K?D< minimum si4e) ith a ladder1assist #ost) hen re(uired' Sho) details on the ra) ings' Sho) all locations on . oo! Plan ra) ings'

. oo! curbs to be minimum 1C1gauge galvani4ed steel $heavier i! re(uired !or s#eci!ic e(ui#ment%, integrally) elded, #ressure1treated) ood nailers, raised cant integral) ith curb $si4e to match roo! insulation%, and minimum 11106R rigid !iberglass insulation'

9 here re(uired, ex#ansion &oints shall use ? dimensional bello) s in order to accommodate x,y, and 4, directional building movement'

'(6) '' %!! lied Fire! roofin"

S#rayed Fire1 . esistive " aterials $SF . " % are to be s#eci!ied as F " *##roved #roducts'

-nstaller must be certi!ied, licensed, or other) ise (uali!ied by !ire#roo!ing manu!acturer as ex#erienced and) ith su!!icient trained sta!! to install manu!acturer-s #roducts according to s#eci!ied re(uirements'

Pre1installation con!erence is re(uired, as) ell as moc/1u#s !or each !ire resistance design designation demonstrating the minimum !ire#roo!ing thic/nesses needed to achieve re(uired !ire1resistance rating o! each structural com#onen[illegible]

2ond StrengthE " inimum 17D1lb!0s(' !t' cohesive and adhesive strength based on !ield testing according to *ST" , 8?B'

ThicknessE *s re(uired !or !ire1resistance design i

Submit !our sam#le /its in !orm o! manu!acturer-s standard bead sam#les, consisting o! stri#s o! actual #roducts sho)ing !ull range o! colors available, !or each #roduct ex#osed to vie)'

Submit manu!acturer-s certi!icate that #roducts meet or exceed s#eci!ied re(uirements and are suitable !or use indicated'

S#eci!y a manu!acturer s#eciali4ing in manu!acturing the #roducts s#eci!ied in this Section)ith minimum ten years documented ex#erience'

Submit an a##licator s#eciali4ing in a##lying the)or/ o! this Section)ith minimum !ive years documented ex#erience' . e!erences)ill be made available u#on re(uest'

Con!orm to *ST" C11G? re(uirements !or materials and installation'

3btain &oint sealant materials !rom a single manu!acturer !or each di!!erent #roduct re(uired'

Provide &oint sealants, &oint !illers, and other related materials that are com#atible)ith one another and)ith &oint substrates under conditions o! service and a##lication, as demonstrated

?' -nterior Uoints in Hertical Sur!aces and +ori4ontal ; ontra!!ic Sur!acesE

a' Control and ex#ansion ℓoints on ex#osed interior sur!aces o! exterior) alls'