For STIWG May 2005

There is a current action to add the following new category of Road Conditions to the Physical Element codes (PE codes) of SHEF….

KC = Road Surface Conditions, where:
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        0=DRY
        1=DAMP
        2=WET
        3=ICE
        4=SALT
        5=FREEZING WET
        99=UNKNOWN
KE = Error Check Value
KF = Road Surface Freezing Temperature (Degrees F,C) (will = 9999 when salt content =0)
KH = Road Surface Water height (IN,MM)
KS = Road Surface, Salt Content  (%)  (will = 9999 when salt content =0)
KT = Road Surface, Temperature (Degrees F,C)


PE codes below in Bold have been approved for use, but have not yet been added to the
"Official SHEF Handbook" document.
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Web page for SHEF Handbook and other SHEF details.

http://www.nws.noaa.gov/directives/010/pd01009044b.pdf (page 71)

Table 1. Physical Elements Codes -

CODE　　　*EXPLANATION (UNITS)*

A　　　　　**AGRICULTURAL DATA**

AD　　　Reserved

AF　　　 Surface frost intensity (coded, see Table 20)
AG　　　 Percent of green vegetation (%)

AM　　　 Surface dew intensity (coded, see Table 21)

AT　　　 Time below critical temperature, 25 DF or -3.9 DC (HRS and MIN)

AU　　　Time below critical temperature, 32 DF or 0 DC (HRS and MIN)

AW　　　Leaf wetness (HRS and MIN)

BA　　　Solid portion of water equivalent (in, mm)

BB　　　Heat deficit (in, mm)

BC　　　Liquid water storage (in, mm)

BD   Temperature index (DF, DC)

BE   Maximum water equivalent since snow began to accumulate (in, mm)

BF   Areal water equivalent just prior to the new snowfall (in, mm)

BG   Areal extent of snow cover from the areal depletion curve just prior to the new snowfall

(%)

BH   Amount of water equivalent above which 100 % areal snow cover temporarily exists (in, mm)

BI   Excess liquid water in storage (in, mm)

BJ   Areal extent of snow cover adjustment (in, mm)

BK   Lagged excess liquid water for interval 1 (in, mm)

BL   Lagged excess liquid water for interval 2 (in, mm)

BM   Lagged excess liquid water for interval 3 (in, mm)

BN   Lagged excess liquid water for interval 4 (in, mm)

BO   Lagged excess liquid water for interval 5 (in, mm)

BP   Lagged excess liquid water for interval 6 (in, mm)

BQ   Lagged excess liquid water for interval 7 (in, mm)

CA   Upper zone tension water contents (in, mm)

CB   Upper zone free water contents (in, mm)

CC   Lower zone tension water contents (in, mm)

CD   Lower zone free water supplementary storage contents (in, mm)

CE   Lower zone free water primary storage contents (in, mm)

CF   Additional impervious area contents (in, mm)

CG   Antecedent precipitation index (in, mm)

CH   Soil moisture index deficit (in, mm)

CI   Base flow storage contents (in, mm)

CJ   Base flow index (in, mm)

CK   First quadrant index Antecedent Evaporation Index (AEI) (in, mm)

CL   First quadrant index Antecedent Temperature Index (ATI) (DF, DC)

CM   Frost index (DF, DC)

CN   Frost efficiency index (%)

CO   Indicator of first quadrant index (AEI or ATI)

CP   Storm total rainfall (in, mm)

CQ   Storm total runoff (in, mm)

CR   Storm antecedent index (in, mm)

CS   Current antecedent index (in, mm)

CT   Storm period counter (integer)

CU   Average air temperature (DF, DC)

CV   Current corrected synthetic temperature (DF, DC)

CW   Storm antecedent evaporation index, AEI (in, mm)

CX   Current AEI (in, mm)

CY   Current API (in, mm)

CZ   Climate Index

D   RESERVED FOR DATE/DATA TYPE NONPHYSICAL ELEMENTS (See Table 9a and 9b) [Date and Time]

E   EVAPORATION

EA   Evapotranspiration potential amount (IN, MM)

ED   Evaporation, pan depth (IN, MM)

EM   Evapotranspiration amount (IN, MM)

EP   Evaporation, pan increment (IN, MM)

ER   Evaporation rate (IN/day, MM/day)

ET   Evapotranspiration total (IN, MM)

EV   Evaporation, lake computed (IN, MM)

F   FISH COUNT DATA

FA   Fish - shad

FB   Fish - sockeye

FC   Fish - chinook

FE   Fish - chum

FK   Fish - coho

FL   Fish - ladder (1=left, 2=right, 3=total)

FP   Fish - pink

FS   Fish – steelhead

FT   Fish type - type (1=adult, 2=jacks, 3=fingerlings)

FZ   Fish - count of all types combined

G   GROUND FROST AND GROUND STATE

GD   Frost depth, depth of frost penetration, non permafrost (IN, CM)

GR   Frost report, structure (coded, see Table 16)

GS   Ground state (coded, see Table 18)

GT   Frost, depth of surface frost thawed (IN, CM)

H   HEIGHT

HA   Height of reading, altitude above surface (FT, M)

HB   Depth of reading below surface (FT, M)

HC   Height, ceiling (FT, M)

HD   Height, head (FT, M)

HE   Height, regulating gate (FT, M)

HF   Elevation, project powerhouse forebay (FT, M)

HG   Height, river stage (FT, M)

HH   Height of reading, elevation in MSL (FT, M)

HI   Stage trend indicator (coded, see Table 19)

HJ   Height, spillway gate (FT, M)

HK   Height, lake above a specified datum (FT, M)

HL   Elevation, natural lake (FT, M)

HM   Height of tide, MLLW (FT, M)

HN (S)Height, river stage, daily minimum, translates to HGIRZNZ (FT, M)

HO   Height, flood stage (FT, M)

HP   Elevation, pool (FT, M)

HQ   Distance from a ground reference point to the river's edge used to estimate stage (coded, see Chapter 7.4.6)

HR   Elevation, lake or reservoir rule curve (FT, M)

HS   Elevation, spillway forebay (FT, M)

HT   Elevation, project tail water stage (FT, M)

HU   Height, cautionary stage (FT, M)

HW   Height, spillway tail water (FT, M)

HX (S)Height, river stage, daily maximum, translates to HGIRZXZ (FT, M)

HY (S)Height, river stage at 7 a.m. local just prior to date-time stamp, translates to HGIRZZZ at 7 a.m. local time (FT, M)

HZ   Elevation, freezing level (KFT, KM)

I   ICE CODES

IC   Ice cover, river (%)

IE   Extent of ice from reporting area, upstream "+", downstream - (MI, KM)

IO   Extent of open water from reporting area, downstream "+", upstream - (FT, M)

IR   Ice report type, structure, and cover (coded, see Table 14)

IT   Ice thickness (IN, CM)

J   **RESERVED**

K   **RESERVED**

L   **LAKE DATA**

LA   Lake surface area (KAC,KM2)

LC   Lake storage volume change (KAF,MCM)

LS   Lake storage volume (KAF,MCM)

M   **MOISTURE AND FIRE/FUEL PARAMETERS**

MD   Dielectric Constant at depth, paired value vector (coded, see Chapter 7.4.6 for format)

MI   Moisture, soil index or API (IN, CM)

ML   Moisture, lower zone storage (IN, CM)

MM   Fuel moisture, wood (%)

MN   Soil Salinity at depth, paired value vector (coded, see Chapter 7.4.6 for format)

MS   Soil Moisture amount at depth (coded, see Chapter 7.4.6)

MT   Fuel temperature, wood probe (DF, DC)

MU   Moisture, upper zone storage (IN, CM)

MV   Water Volume at Depth, paired value vector (coded, see Chapter 7.4.6 for format)

MW   Moisture, soil, percent by weight (%)

N   **GATE AND DAM DATA**

NC   River control switch (0=manual river control, 1=open river uncontrolled)

NG   Total of gate openings (FT, M)

NL   Number of large flash boards down (whole number)

NN   Number of the spillway gate reported (used with HP, QS)

NO   Gate opening for a specific gate (coded, see Chapter 7.4.6)

NS   Number of small flash boards down (whole number)

O   NOT USED FOR EXTERNAL TRANSMISSION (CONFUSED WITH ZERO)

P   PRESSURE AND PRECIPITATION

PA   Pressure, atmospheric (IN-HG, KPA)

PC   Precipitation, accumulator (IN, MM)

PD   Pressure, atmospheric net change during past 3 hours (IN-HG, KPA)

PE   Pressure, characteristic, NWS Handbook #7, table 10.7

PF (S) Precipitation, flash flood guidance, precipitation to initiate flooding, translates to PPTCF for 3-hour intervals (IN, MM)

PL   Pressure, sea level (IN-HG, KPA)

PM   Probability of measurable precipitation (dimensionless) (coded, see Table 22)

PN   Precipitation normal (IN, MM)

PP   Precipitation (includes liquid amount of new snowfall), actual increment (IN, MM)

PR   Precipitation rate (IN/day, MM/day)

PT   Precipitation, type (coded, see Table 17)

PY (S) Precipitation, increment ending at 7 a.m. local just prior to date-time stamp, translates to PPDRZZZ at 7 a.m. local time (IN, MM)

Q   DISCHARGE

QA   Discharge, adjusted for storage at project only (KCFS, CMS)

QB   Runoff depth (IN, MM)

QC   Runoff volume (KAF, MCM)

QD   Discharge, canal diversion (KCFS, CMS)

QE   Discharge, percent of flow diverted from channel (%)

QF   Discharge velocity (MPH, KPH)

QG   Discharge from power generation (KCFS, CMS)

QI   Discharge, inflow (KCFS, CMS)

QL   Discharge, rule curve (KCFS, CMS)

QM   Discharge, preproject conditions in basin (KCFS, CMS)

QN (S)Discharge, minimum flow, translates to QRIRZNZ (KCFS, CMS)

QP   Discharge, pumping (KCFS, CMS)

QR   Discharge, river (KCFS, CMS)

QS   Discharge, spillway (KCFS, CMS)

QT   Discharge, computed total project outflow (KCFS, CMS)

QU   Discharge, controlled by regulating outlet (KCFS, CMS)

QV   Cumulative volume increment (KAF, MCM)

QX (S)Discharge, maximum flow, translates to QRIRZXZ (KCFS, CMS)

QY (S)Discharge, river at 7 a.m. local just prior to date-time stamp translates to QRIRZZZ at

     7 a.m. local time (KCFS, CMS)

R   RADIATION

RA   Radiation, albedo (%)

RI   Radiation, accumulated incoming solar over specified duration in langleys (LY)

RN   Radiation, net radiometers (watts/meter squared)

RP   Radiation, sunshine percent of possible (%)

RT   Radiation, sunshine hours (HRS)

RW   Radiation, total incoming solar radiation (watts/meter squared)

S   SNOW DATA

SA   Snow, areal extent of basin snow cover (%)

SB   Snow, Blowing Snow Sublimation (IN)

SD   Snow, depth (IN, CM)

SE   Snow, Average Snowpack Temperature (DF)

SF   Snow, depth, new snowfall (IN, CM)

SI   Snow, depth on top of river or lake ice (IN, CM)

SL   Snow, elevation of snow line (KFT, M)

SM   Snow, Melt (IN)

SP   Snowmelt plus rain (IN)

SR   Snow report, structure, type, surface, and bottom (coded, see Table 15)

SS   Snow density (IN SWE/IN snow, CM SWE/CM snow)

ST   Snow temperature at depth measured from ground (See Chapter 7.4.6 for format)

SU   Snow, Surface Sublimation (IN)

SW   Snow, water equivalent (IN, MM)

T   TEMPERATURE DATA

TA   Temperature, air, dry bulb (DF,DC)

TB   Temperature in bare soil at depth (coded, see Chapter 7.4.6 for format)

TC   Temperature, degree days of cooling, above 65 DF or 18.3 DC (DF,DC)

TD   Temperature, dew point (DF,DC)

TE   Temperature, air temperature at elevation above MSL (See Chapter 7.4.6 for format)

TF   Temperature, degree days of freezing, below 32 DF or 0 DC (DF,DC)

TH   Temperature, degree days of heating, below 65 DF or 18.3 DC (DF,DC)

TM   Temperature, air, wet bulb (DF,DC)

TN (S) Temperature, air minimum, translates to TAIRZNZ (DF,DC)

TP   Temperature, pan water (DF,DC)

TS   Temperature, bare soil at the surface (DF,DC)

TV   Temperature in vegetated soil at depth (coded, see Chapter 7.4.6 for format)

TW   Temperature, air maximum, translates to TAIRZXZ (DF,DC)

U   WIND DATA

UC   Wind, accumulated wind travel (MI,KM)

UD   Wind, direction (whole degrees)

UG   Wind, gust at observation time (MI/HR,M/SEC)

UL   Wind, travel length accumulated over specified (MI,KM)

UP   Peak wind speed (MPH)

UQ   Wind direction and speed combined (SSS.SDDD), a value of 23.0275 would indicate a wind of 23.0 mi/hr from 275 degrees

UR   Peak wind direction associated with peak wind speed (in tens of degrees)

US   Wind, speed (MI/HR,M/SEC)

V   GENERATION AND GENERATOR DATA

VB   Voltage - battery (volt)

VC   Generation, surplus capacity of units on line (megawatts)

VE   Generation, energy total (megawatt hours)

VG   Generation, pumped water, power produced (megawatts)

VH   Generation, time (HRS)

VJ   Generation, energy produced from pumped water (megawatt hours)

VK   Generation, energy stored in reservoir only (megawatt * "duration")

VL   Generation, storage due to natural flow only (megawatt * "duration")

VM   Generation, losses due to spill and other water losses (megawatt * "duration")

VP   Generation, pumping use, power used (megawatts)

VQ   Generation, pumping use, total energy used (megawatt hours)

VR   Generation, stored in reservoir plus natural flow, energy potential

(megawatt * "duration")

VS   Generation, station load, energy used (megawatt hours)

VT   Generation, power total (megawatts)

VU   Generator, status (encoded)

VW   Generation station load, power used (megawatts)

W   WATER QUALITY

WA   Water, dissolved nitrogen & argon (PPM, MG/L)

WC   Water, conductance (uMHOS/CM)

WD   Water, piezometer water depth (IN, CM)

WG   Water, dissolved total gases, pressure (IN-HG, MM-HG)

WH   Water, dissolved hydrogen sulfide (PPM, MG/L)

WL   Water, suspended sediment (PPM, MG/L)

WO   Water, dissolved oxygen (PPM, MG/L)

WP   Water, ph (PH value)

WS   Water , salinity (PPT)

WT   Water, turbidity (JTU)

WV   Water, velocity (FT/SEC, M/SEC)

WX   Dissolved Oxygen - Saturation Percent (%)

WY   Chlorophyll (UG/L)

X   WEATHER CODES

XC   Total sky cover (tenths)

XG   Lightning, number of strikes per grid box (whole number)

XL   Lightning, point strike, assumed one strike at transmitted latitude and longitude

(whole number)

XP   Weather, past NWS synoptic code (see Appendix D)

XR   Humidity, relative (%)

XU   Humidity, absolute (grams/FT3,grams/M3)

XV   Weather, visibility (MI, KM)

XW   Weather, present NWS synoptic code (see Appendix C)

Y   RESERVED FOR UNIQUE, STATION SPECIFIC TYPE CODES

YA->YZ Assigned on an individual basis for unique data, except as noted below

YA   Number of 15-minute periods a river has been above a specified critical level (whole number)

YC   Random report sequence number (whole number)

YF   Forward power, a measurement of the DCP, antenna, and coaxial cable (watts)

YR   Reflected power, a measurement of the DCP, antenna, and coaxial cable (watts)

YS   Sequence number of the number of times the DCP has transmitted (whole number)

YT   Number of 15-minute periods since a random report was generated due to an

     increase of 0.4 inch of precipitation (whole number)

Z   RESERVED