



PROVINCIA DI SAVONA

## STUDIO DELLE FASCE FLUVIALI DEI SOTTOBACINI DEL FIUME BORMIDA DI SPIGNO E DEL FIUME BORMIDA DI MILLESIMO

### ATTIVITA' G – ANALISI IDRAULICA

## RELAZIONE ILLUSTRATIVA DELLE ANALISI IDRAULICHE

### RELAZIONE – ALLEGATO 1 (SEZIONI TRASVERSALI)

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REV.	DATA	REDAZIONE	VERIFICA	AUTORIZZAZIONE	MODIFICHE										

RIPRODUZIONE O CONSEGNA A TERZI SOLO DIETRO SPECIFICA AUTORIZZAZIONE

## INDICE

1. PREMESSA	1
2. RILIEVI TOPOGRAFICI	1
3. VERIFICHE IDRAULICHE ED AREE INONDABILI	2
3.1 STUDIO IDRAULICO	2
3.1.1 Condizioni di simulazione	2
3.1.2 Condizioni al contorno	3
3.1.3 Parametri di scabrezza	3
3.1.4 Strutture idrauliche e di controllo	5
3.2 PERIMETRAZIONE DELLE AREE INONDABILI	7
ALLEGATO 1 -     Sezioni trasversali e livelli di piena	

## **1. PREMESSA**

La presente relazione illustra le metodologie ed i risultati dello studio idraulico mediante modellistica numerica dei tratti di corso d'acqua oggetto di indagine.

In particolare vengono qui affrontati i punti 4 e 5 dell'attività G "Analisi idraulica" secondo lo schema presentato nella "Relazione illustrativa metodologie di lavoro e strumentazione" (Luglio 2001) e ripreso interamente nel "Programma di lavoro" (Dicembre 2001).

Vengono quindi affrontati gli aspetti relativi ai rilievi topografici (G.4) ed allo studio idraulico finalizzato alla perimetrazione delle aree inondabili (G.5)

Per quanto riguarda le altre attività facenti parte della stessa fase G (*G.1 Individuazione dei tratti urbanizzati, G.2 Realizzazione del catasto delle opere idrauliche significative per l'assetto del corso d'acqua, G.3 Individuazione delle infrastrutture e degli insediamenti condizionanti l'assetto del corso d'acqua*), si rimanda all'elaborato 11.

## **2. RILIEVI TOPOGRAFICI**

Il rilievo topografico delle sezioni trasversali dei corsi d'acqua interessati dallo studio è stato condotto in accordo con quanto presentato nel "Programma di lavoro" e nelle successive "Modifiche ed integrazioni al programma di lavoro", predisposte in seguito alle osservazioni presentate dalla Provincia di Savona nell'incontro del 31 Gennaio 2002.

Le modifiche ed integrazioni al programma di lavoro sono state successivamente accolte dalla stessa amministrazione a seguito della verifica dei tratti indagati e nel rispetto di quanto dichiarato in fase di gara.

Si rimanda pertanto a tale documento per la descrizione delle differenti metodologie di rilievo utilizzate e dei tratti di alveo indagati.

Nell'allegato 1 alla presente relazione vengono riportate, come richiesto dall'Amministrazione Provinciale, le sezioni di calcolo rilevate, per tutte e tre le tipologie di rilievo adottate, con rappresentati i massimi livelli di piena raggiunti all'occorrere dei fissati eventi statistici.

La localizzazione topografica definitiva delle sezioni rilevate viene riportata sulle tavole relative alle aree inondabili con criterio idraulico (elaborato 10).

Le sezioni utilizzate nella modellazione numerica presentano qualche scostamento in termini di numero e localizzazione rispetto a quanto definito nelle "Modifiche ed integrazioni al programma di lavoro" a causa di esigenze di rilievo riscontrate sul campo, ma non inducono sostanziali variazioni alla struttura complessiva del rilievo dell'alveo.

In aggiunta alle sezioni di rilievo, sono state aggiunte alcune sezioni, peraltro non riportate in planimetria ed in forma grafica in allegato, necessarie ai fini della modellazione idraulica ed, in particolare, delle confluenze.

Tali sezioni sono state ottenute mediante interpolazione grafica ed il risultato in termini di livello è comunque riportato nelle tabelle riassuntive delle grandezze idrauliche successivamente descritte.

### **3. VERIFICHE IDRAULICHE ED AREE INONDABILI**

#### **3.1 STUDIO IDRAULICO**

Lo studio idraulico dei tratti in esame è stato condotto mediante l'applicazione del codice di calcolo MIKE11 HD del DHI Water & Environment, in assetto di moto vario.

Una descrizione dettagliata delle caratteristiche del modello utilizzato è riportata nell'allegato 4 al presente elaborato.

Il modello è stato applicato a tutti i tratti in esame compresi tra la prima sezione di monte e l'ultima sezione di valle rilevata.

Lo studio è stato condotto separatamente per ogni corso d'acqua indagato, pur garantendo la continuità del profilo idraulico complessivo in condizioni di piena.

Vengono sotto richiamate con maggior dettaglio metodologico le fasi principali dell'analisi idraulica.

##### **3.1.1 Condizioni di simulazione**

Le simulazioni sono state condotte considerando separatamente ogni singolo corso d'acqua, introducendo le variazioni di portata derivanti dall'aumento di area drenata verso valle come contributi laterali al sistema.

Tale assunzione ha permesso di rispettare interamente i valori determinati dallo studio idrologico, per la descrizione del quale si rimanda al relativo elaborato 4, rappresentando ugualmente il fenomeno di traslazione dell'onda di piena in alveo che, per tratti sufficientemente lunghi quali quelli in esame, risulta significativamente condizionante le condizioni di deflusso della portata in alveo e, quindi, i livelli raggiunti durante la propagazione della piena.

### 3.1.2 Condizioni al contorno

Sono state utilizzate le seguenti condizioni al contorno al sistema:

- Scala di deflusso in moto uniforme nelle sezioni di valle dello studio per i rami principali delimitati dal confine regionale (Bormida di Spigno, Bormida di Millesimo, Torrente Valla);
- Livello di piena di pari tempo di ritorno del corso d'acqua ricettore per gli affluenti, ad esclusione dell'evento cinquecentennale per il quale si è usato il livello del ricettore con tempo di ritorno di 200 anni;
- Idrogramma di portata derivante dallo studio idrologico per le sezioni di monte di tutti i rami per eventi con tempo di ritorno pari a 50, 200 e 500 anni;
- Idrogrammi di portata laterali, distribuiti lungo la progressiva, relativi ai bacini imbriferi residui di competenza dei rami stessi.

Si evidenzia come le condizioni al contorno di valle degli affluenti nascano da un criterio decisamente cautelativo, in quanto l'ipotesi di coincidenza del picco di piena con quello del corpo ricettore rappresenta un fenomeno idrologico caratterizzato da un periodo di ritorno superiore rispetto a quello rappresentato dall'idrogramma di portata introdotto.

### 3.1.3 Parametri di scabrezza

La valutazione dei parametri di scabrezza, nonché delle perdite di carico concentrate ai restringimenti, da introdurre nel modello è stata condotta attraverso sopralluoghi in campo ed analisi fotografica.

I valori dei parametri introdotti sono concordi con quanto indicato nella Raccomandazione N°7 dell'Autorità di Bacino della Regione Liguria "Definizione delle fasce di inondabilità e di riassetto fluviale" nella quale viene proposto il seguente schema per la scelta del valore massimo del parametro di Gauckler-Strickler:

Descrizione dell'alveo	
Tratti montani di corsi d'acqua naturali con salti, rocce o vegetazione anche arbustiva-arborea in alveo.	25-30
Corsi d'acqua naturali con vegetazione e movimento di materiale sul fondo.	30-35
Tratti urbanizzati di corsi d'acqua naturali con argini cementati e/o platee in buono stato.	35-40

Descrizione dell'alveo	
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Corsi d'acqua con fondo ed argini totalmente cementati in ottimo stato ed assenza di manufatti (tubi, cavi, ecc...) o discontinuità interferenti con le acque.	40-45
Tombinature perfettamente lisce e dotate a monte di dispositivi atti ad assicurare la trattenuta di trasporto solido di fondo ed in sospensione (briglie selettive, vasche di sedimentazione, ecc...).	50-55

Tabella 1 - Valori del parametro di Strickler proposti dalla Regione Liguria

In accordo con il criterio cautelativo assunto per la modellazione idraulica, relativamente ai tratti in esame sono stati inseriti i valori riportati nella seguente tabella 2.

Tali valori sono da intendersi come media rappresentativa del tratto in esame in quanto il valore di Strickler utilizzato nella modellazione risulta essere variabile non solo lungo l'ascissa curvilinea che descrive la direzione principale della corrente, ma anche in modo trasversale, in modo da rappresentare le maggiori perdite distribuite che caratterizzano aree golenali o di esondazione in genere.

Corso d'acqua	Ks [m <sup>1/3</sup> /s]
<b>B.Millesimo</b>	25
T.Frassino	20
T.Valle	20
Rio Vetria	20
T.Siondo	20
T.Osiglietta	20
T.Zemola	20
Rio Giacchetti	20
Rio Rocchetta	20
<b>B.Spigno</b>	25
Rio Madonna	20
T.Bormiola	20
T.Brange	20
R.Pollovero	20
Rio Carretto	20
Rio Ferrere	20
Rio Ioppa	20
<b>B.Pallare</b>	25
T.Nanta	20
Rio Plodio	20
T.Viazza	20
<b>B.Mallare</b>	25
T.Ferranietta	20
Rio Cappelletta	20
Rio Biterno	20
<b>Corso d'acqua</b>	<b>Ks [m<sup>1/3</sup>/s]</b>
Rio Merlino	20
<b>T.Valla</b>	20

Tabella 2 – Valori medi del parametro di Strickler assunti nella modellazione numerica.

### 3.1.4 Strutture idrauliche e di controllo

I ponti, i tombini, le paratoie aperte e ogni altra struttura che determini un analogo deflusso sono stati rappresentati con un “culvert” procedendo nel modo seguente:

- sono state definite le due sezioni a monte e a valle della struttura, generalmente a distanza di 1,0 m dal paramento di monte e da quello di valle; alla progressiva intermedia tra le due sezioni d'alveo considerate è stato definito il “culvert”; nel caso di disponibilità di una sola sezione d'alveo si è proceduto alla duplicazione di quest'ultima alla progressiva voluta; la sezione d'alveo deve avere dimensioni maggiori o uguali a quelle della luce libera della struttura in esame; spesso è consigliabile considerare una sezione d'alveo di larghezza esattamente pari alla larghezza della struttura in esame;
- la geometria della struttura è stata inserita come “irregular level-width table” con coppie di valori quota- larghezza luce (per larghezza si intende quella complessiva depurata dell'ingombro delle eventuali pile presenti);

Gli stramazzi, briglie, salti di fondo e ogni altra struttura che determini un analogo deflusso sono stati rappresentati con un “broad crested weir” procedendo nel modo seguente:

- sono state definite le due sezioni a monte e valle della struttura, generalmente a distanza di 2,0 m l'una dall'altra e successivamente è stata fissata in mezzeria la progressiva individuante la struttura; nel caso di disponibilità di una sola sezione d'alveo si è proceduto alla duplicazione di quest'ultima alla progressiva e alla quota di fondo voluta; la sezione d'alveo deve avere dimensioni maggiori o uguali a quelle della luce libera della struttura in esame;
- la geometria della struttura è stata inserita come “level-width table” con coppie di valori quota- larghezza luce; nel caso di salto di fondo la geometria deve essere esattamente la stessa della sezione di monte (si estraggono allo scopo i dati di level-width direttamente dai “processed data” di tale sezione);

Le dighe (Osiglia) e traverse (S.Giuseppe di Cairo, Millesimo, Piana Crixia) con notevoli capacità di invaso sono state inserite all'interno del modello come stramazzi. Nel caso di struttura controllata, il livello dello stramazzo è stato considerato in accordo a quanto previsto nelle procedure fissate dalla normativa nazionale, considerando quindi l'apertura progressiva degli scarichi all'arrivo di un messaggio di allerta da parte dei preposti organi di Protezione Civile.

Poiché l'applicazione di tale procedura determina valori di portata in alveo più bassi a valle della struttura stessa rispetto ai risultati dello studio idrologico, sempre seguendo un criterio cautelativo, si è considerato nullo l'effetto di laminazione della diga stessa sul picco

di piena, ripartendo a valle della struttura con l'idrogramma, più elevato, ottenuto mediante analisi idrologica.

A monte della struttura i livelli ottenuti risultano quindi essere in accordo con il fenomeno da rappresentare, essendo naturalmente controllati dal livello dello stramazzo.

Data la particolare singolarità dalla struttura, nel caso della diga di Osiglia, sul T.Osiglietta, il modello idraulico è stato suddiviso in due tratti, l'uno a monte l'altro a valle della struttura stessa.

Sono state introdotte appositamente due ulteriori sezioni denominate "Confluenza lago" e "Valle Diga".

Per il tratto di monte si è considerata come condizione al contorno di valle il livello massimo di stramazzo riportato dai dati costruttivi, e pari a 638.60 m s.l.m., relativo ad una portata in uscita pari a 535 m<sup>3</sup>/s. Tale assunzione risulta fortemente cautelativa in quanto tale portata è molto più bassa di quella indotta dall'evento con tempo di ritorno 500 anni.

Per il tratto di valle si sono invece considerati cautelativamente i valori ottenuti dallo studio idrologico, trascurando quindi l'effetto di laminazione dell'onda di piena indotto dall'invaso, che risulterebbe particolarmente significativo previa apertura degli scarichi di fondo come richiesto dalla normativa già citata, inducendo un abbassamento del livello di regolazione rispetto alla quota di vaso ordinaria.

Poiché la portata uscente dallo scarico di fondo totalmente aperto risulta essere maggiore dell'evento cinquantennale a valle della diga, nella modellazione idraulica è stato usato tale valore al posto di quello ottenuto dallo studio idrologico.

In questo caso, l'area inondabile con tempo di ritorno 50 anni e, di conseguenza, la fascia fluviale A, a valle della struttura rappresentano le porzioni di territorio interessate dall'apertura completa dello scarico di fondo.

Il caso di rottura della struttura, che potrebbe determinare situazioni di rischio più gravose rispetto a quelle qui contemplate, non è stato considerato rimandando, qualora previsto, agli studi specifici richiesti ai gestori in ottemperanza della circolare MIN.LL.PP.n.325/87 in materia di onde di piena artificiali.

I dati geometrici e strutturali utilizzati ai fini della modellazione sono stati acquisiti direttamente presso la società INTERPOWER, con l'esclusione della Traversa di S.Giuseppe di Cairo, attualmente in gestione alla società SCILLA s.r.l. di Cairo.

Copia dei dati geometrici acquisiti è riportata nell'allegato 3 al presente documento.

Nello stesso allegato è anche riportato in coda uno schema del funzionamento del canale di collegamento tra lo sbarramento di Millesimo e quello di Piana Crixia.



## Risultati della modellazione numerica

I risultati della modellazione numerica sono riportati in forma sia grafica (profili longitudinali) sia tabellare, relativamente ad ogni corso d'acqua indagato e ad ogni evento statistico considerato.

Per la consultazione degli stessi si rimanda all'allegato 2 alla presente relazione.

La presentazione dei risultati è stata strutturata seguendo un criterio d'ordine per i corsi d'acqua da ovest ad est e da monte verso valle. E' quindi riportato inizialmente il Bormida di Millesimo, seguito dai relativi affluenti da monte verso valle, e da Bormida di Spigno, Bormida di Pallare, Bormida di Mallare e Torrente Valla.

Le grandezze idrauliche riportate in tabella nell'allegato 2.1 (livello, area, larghezza, velocità, profondità, numero di Froude) rappresentano i valori massimi raggiunti durante l'evento simulato, e non devono pertanto essere intesi come necessariamente simultanei.

Per una maggiore leggibilità delle criticità dovute agli attraversamenti, le grandezze idrauliche relative agli stessi sono state riportate anche in apposite tabelle separate.

L'informazione relativa al sovrizzo indotto dal restringimento non è riportato nei casi di coperture lunghe tanto da rendere non significativo tale dato.

Il franco di sicurezza, ottenuto come differenza tra l'intradosso ed il pelo libero massimo a monte della struttura, è evidenziato in grassetto qualora inferiore ad 1 metro.

La rappresentazione dei livelli massimi per assegnato tempo di ritorno è anche riportata nell'allegato 1 unitamente alla traccia delle sezioni di rilievo.

In forma grafica (allegato 2.2) sono rappresentati i profili di corrente massimi per i tre eventi considerati. Viene inoltre riportato il limite destro e sinistro del rilievo topografico, non sempre coincidente con un'opera di difesa e, di conseguenza, indicato in legenda come "limite".

### **3.2 PERIMETRAZIONE DELLE AREE INONDABILI**

La perimetrazione delle aree inondabili è stata condotta sulla base delle risultanze dello studio idraulico.

Le aree inondabili, che sono riportate nell'elaborato 10 in scala 1:5000 unitamente alla traccia delle sezioni trasversali, sono state quindi tracciate sulla base di livello, larghezza della sezione ed area della sezione, seguendo le indicazioni fornite dalla Regione Liguria nella Raccomandazione per la redazione dei Piani di Bacino Stralcio N°7.

In accordo con tale raccomandazione, nell'area inondabile con tempo di ritorno pari a 500 anni sono anche state inserite tutte le aree incluse nell'atlante delle Aree Storicamente inondate della Regione Liguria aggiornato al 2001, fatta eccezione per eventuali errori di digitalizzazione del file vettoriale, principalmente dovuti alla differente scala di dettaglio di tale documento (1:25.000)

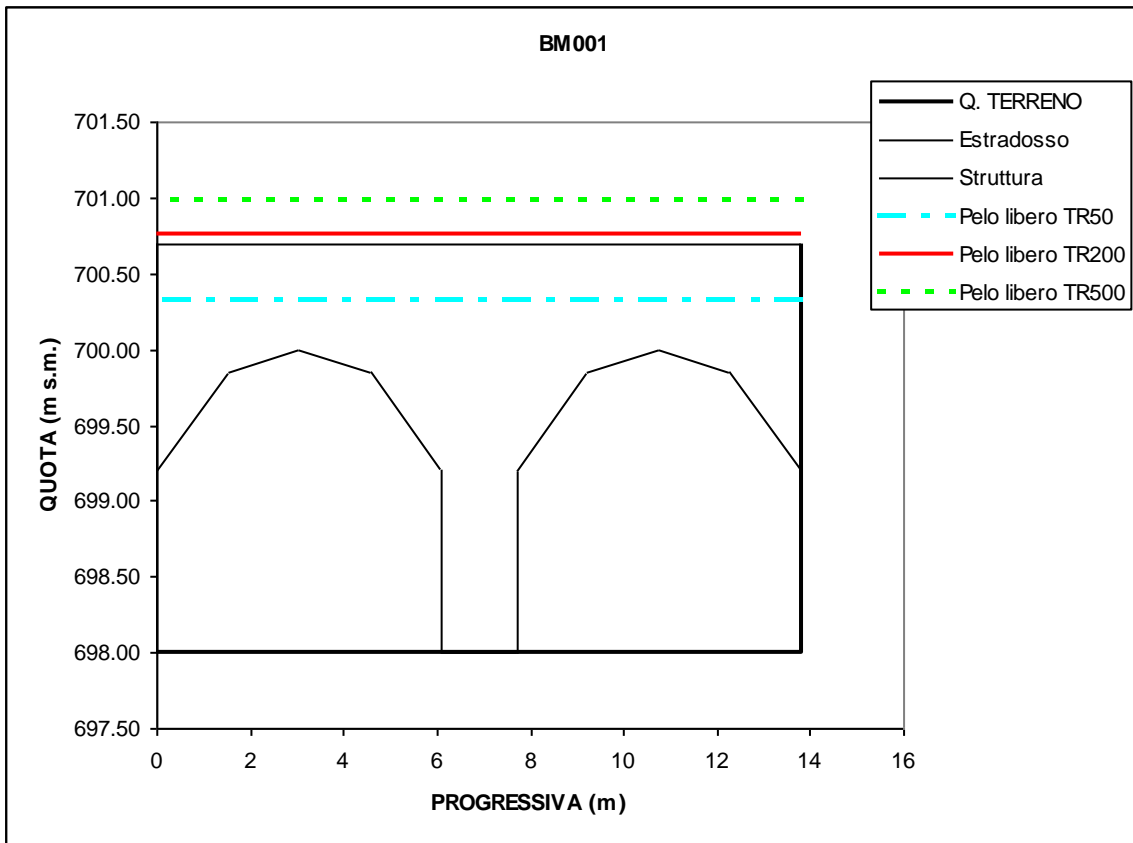
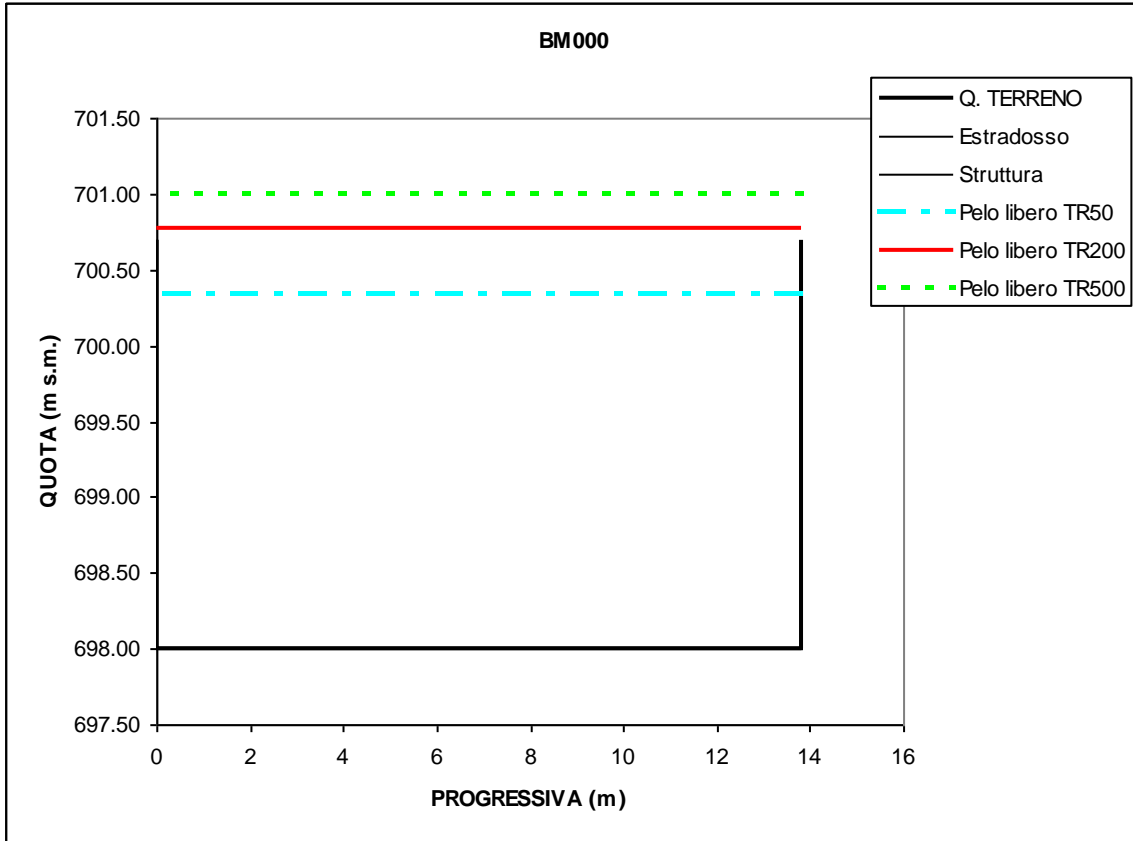
Qualora le linee delimitanti due aree inondabili differenti risultassero sovrapposte, si è seguito, come richiesto, il criterio di precedenza per la pericolosità maggiore, ponendo quindi l'area cinquantennale sempre in evidenza.

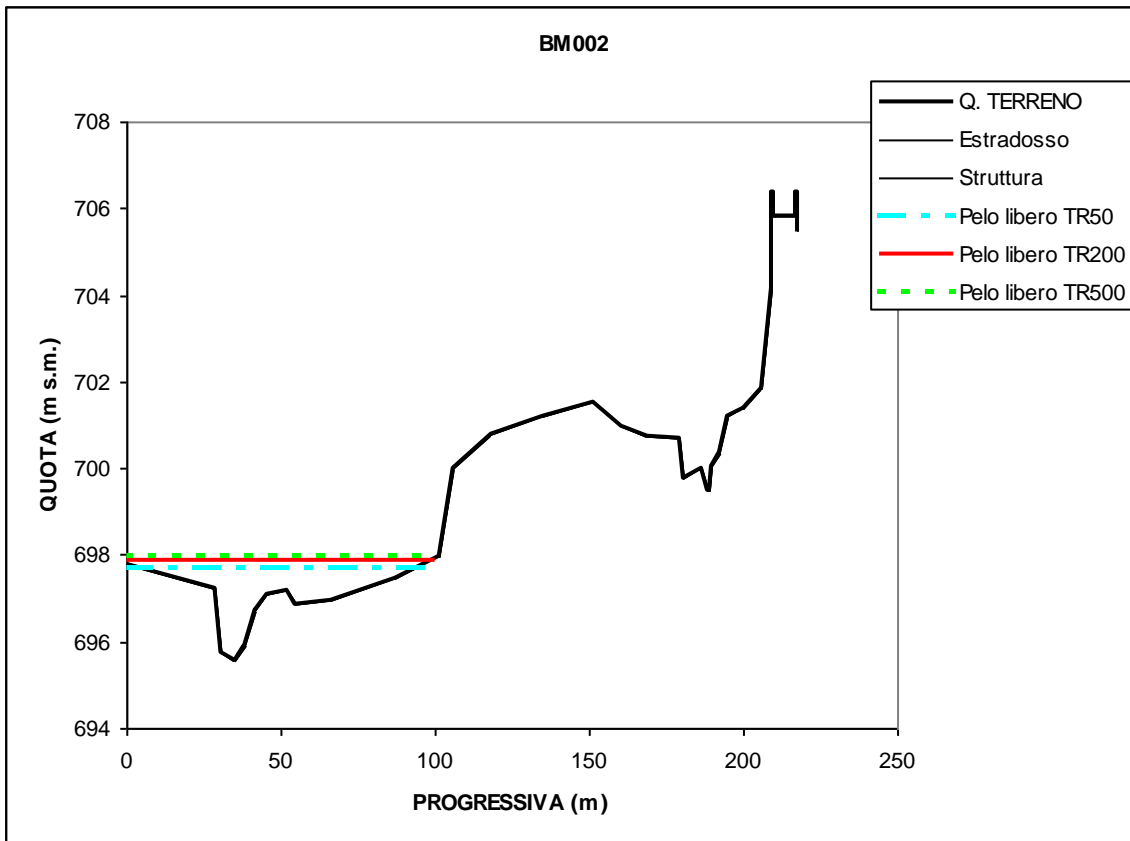
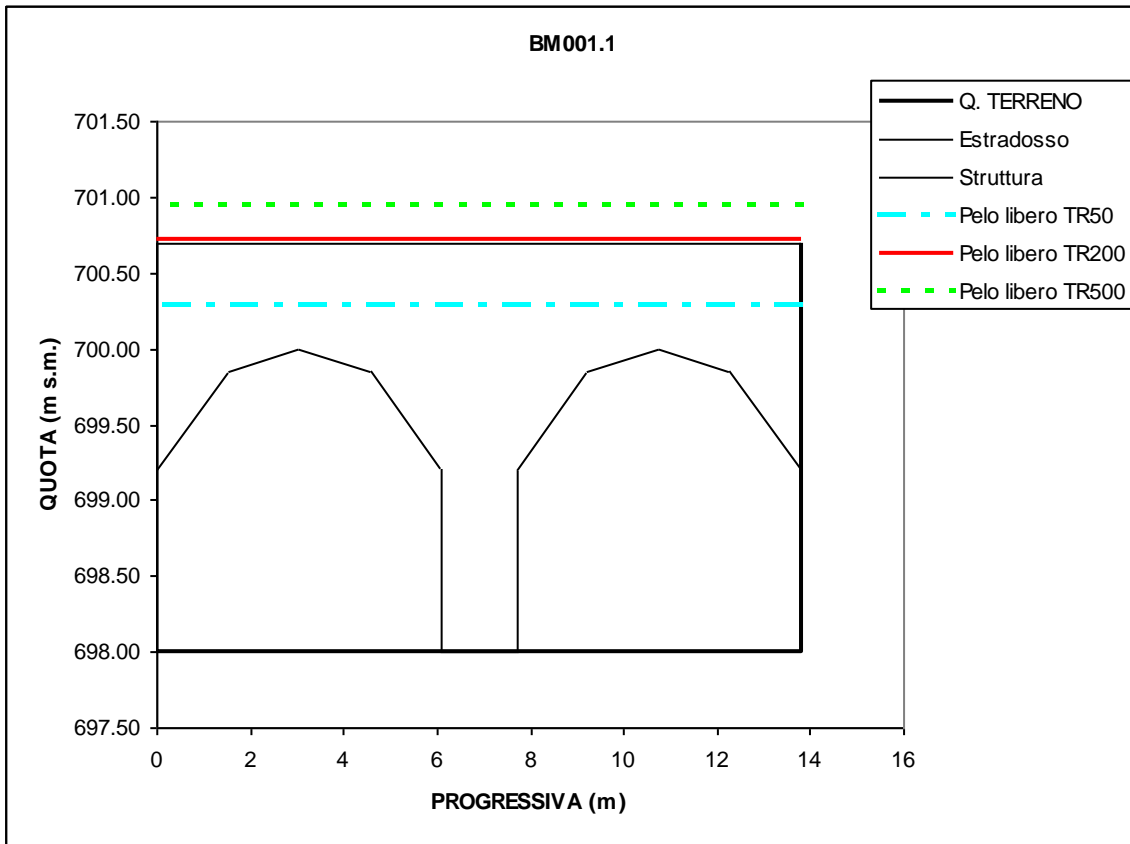
Le aree inondabili così ottenute hanno contribuito, unitamente alle risultanze dello studio geomorfologico e di quello naturalistico-ambientale, alla determinazione delle fasce fluviali, secondo i criteri esposti nella relazione illustrativa dell'attività I, elaborato 16.

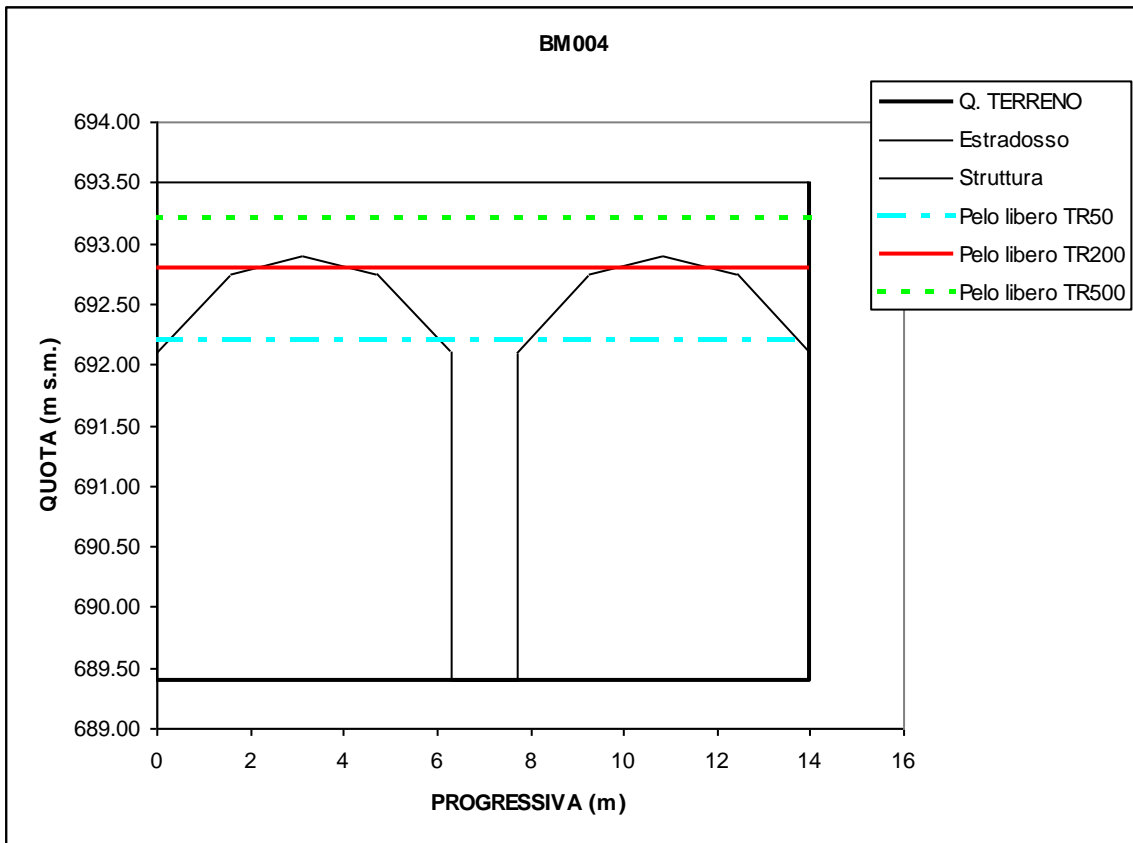
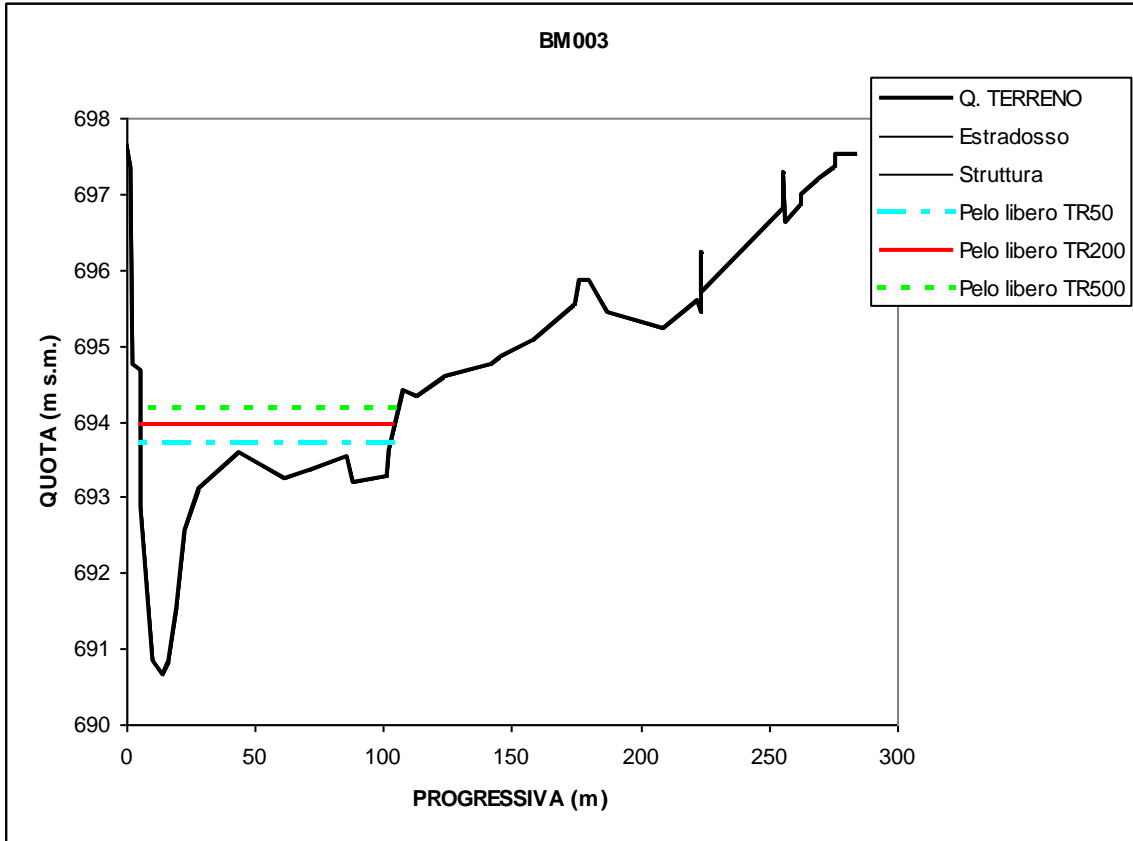
## **ALLEGATO 1**

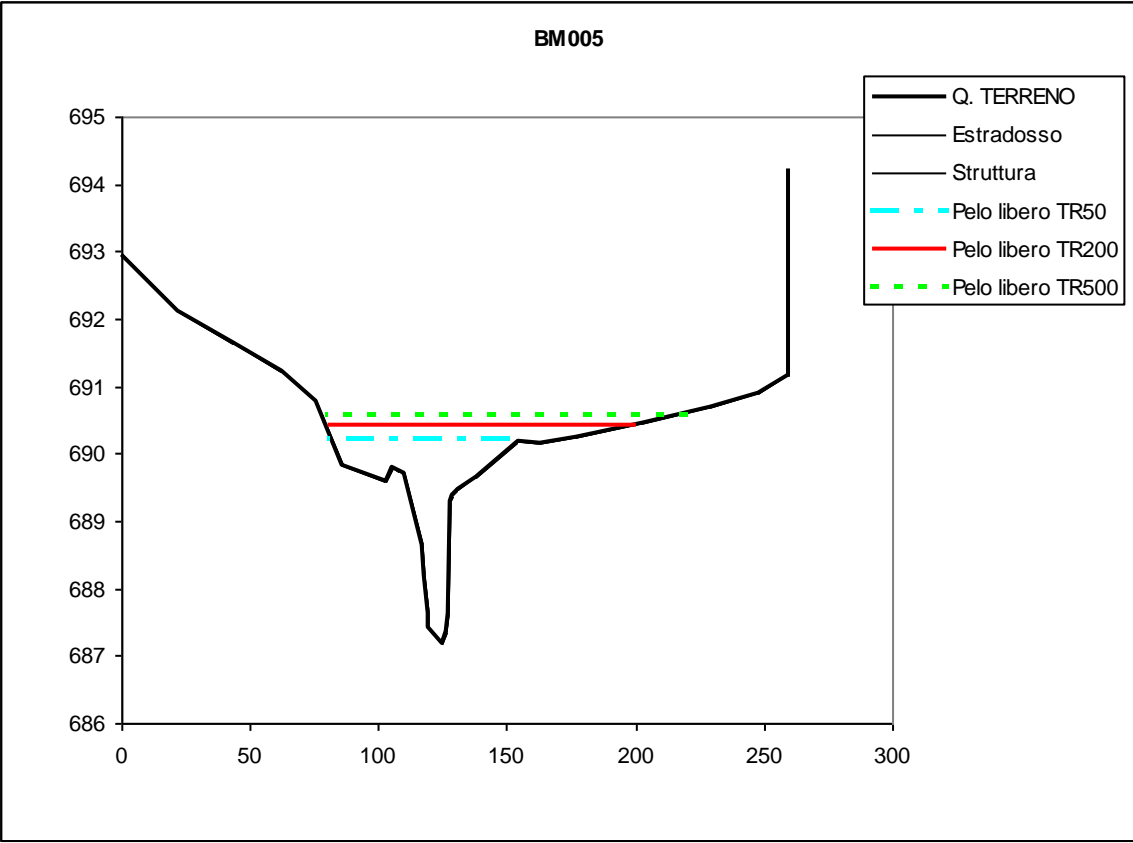
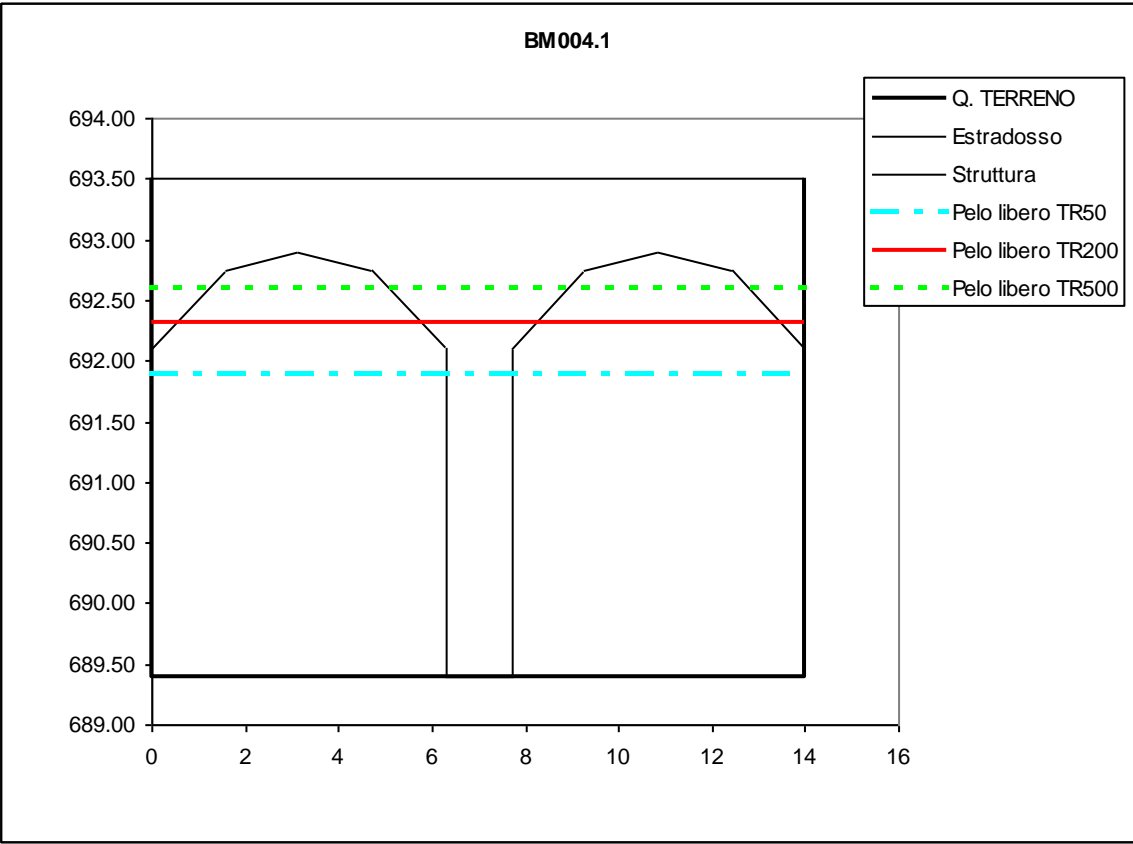
### **Sezioni trasversali e livelli di piena**

# **BORMIDA DI MILLESIMO**

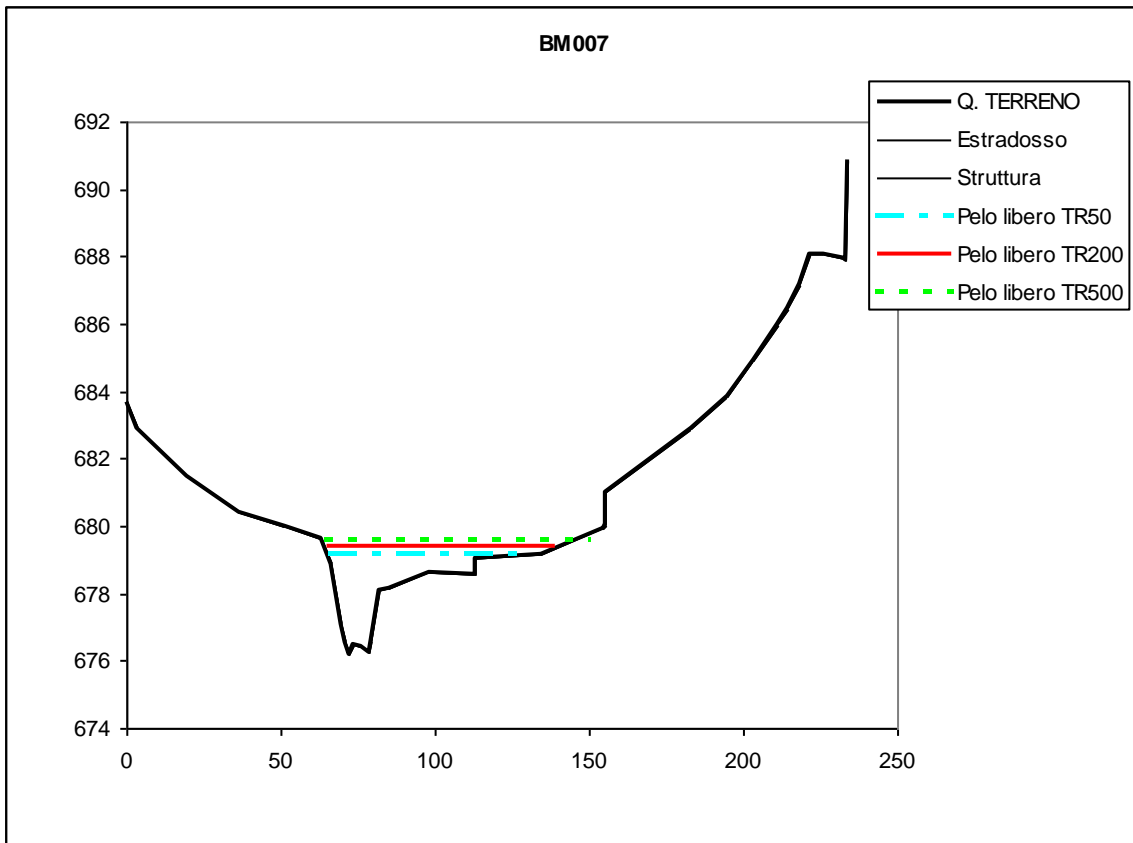
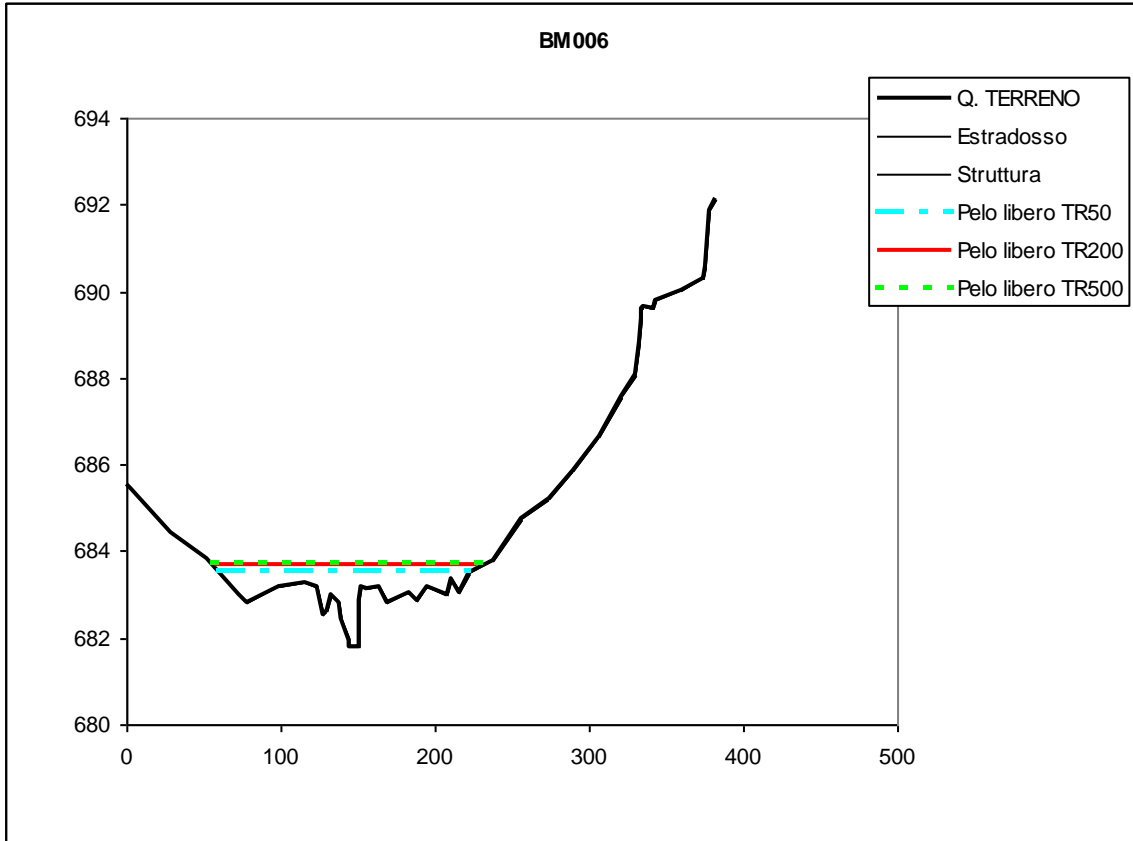


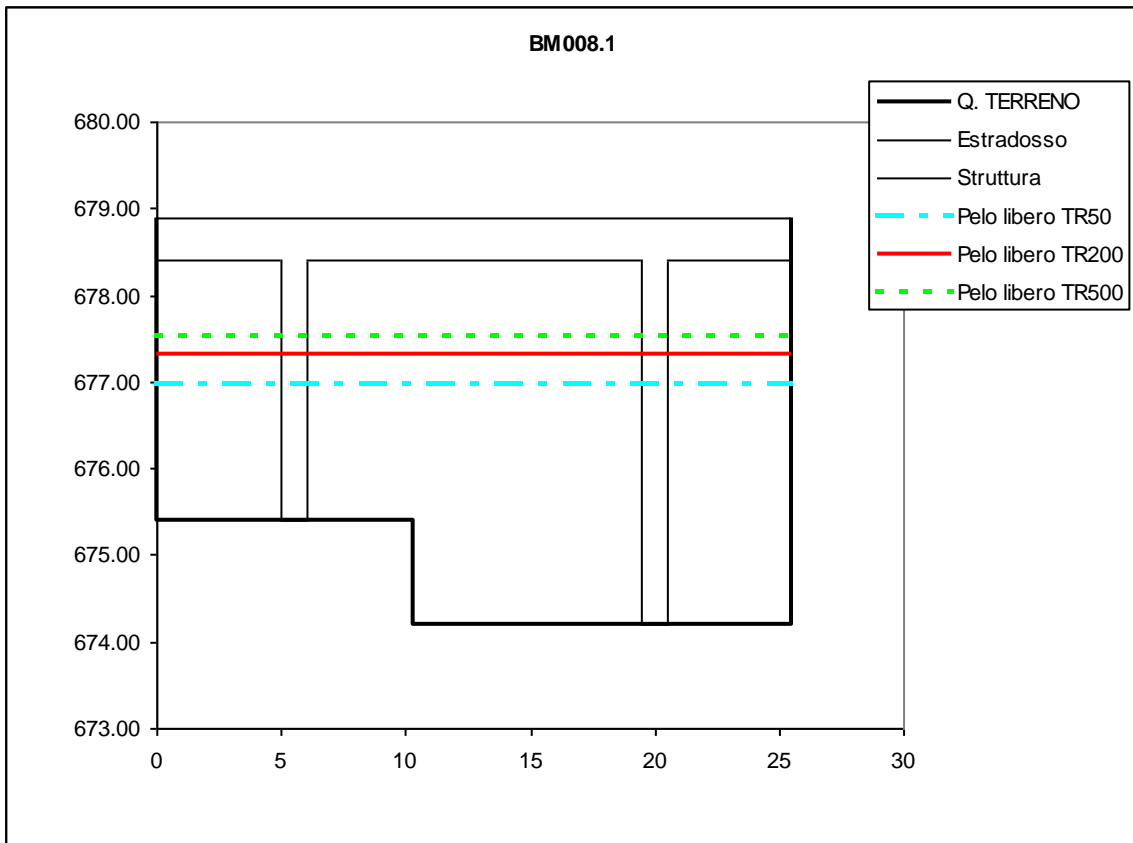
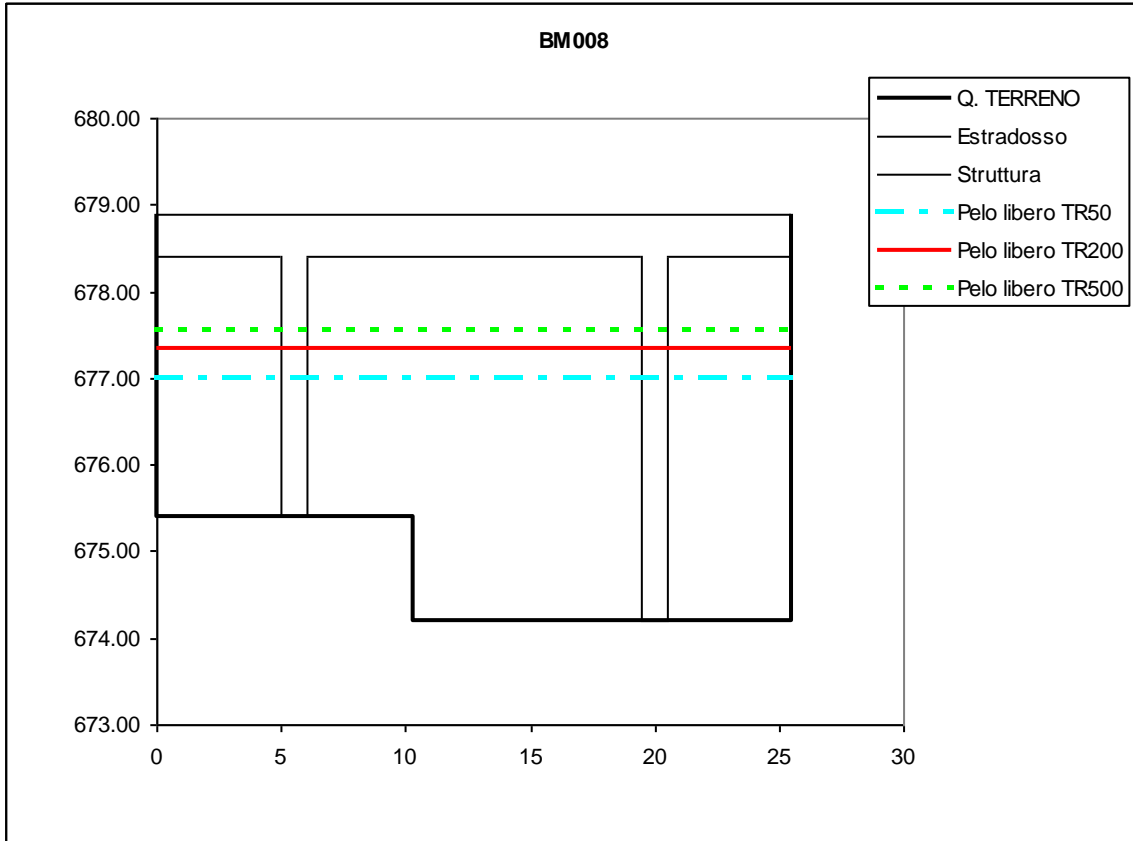


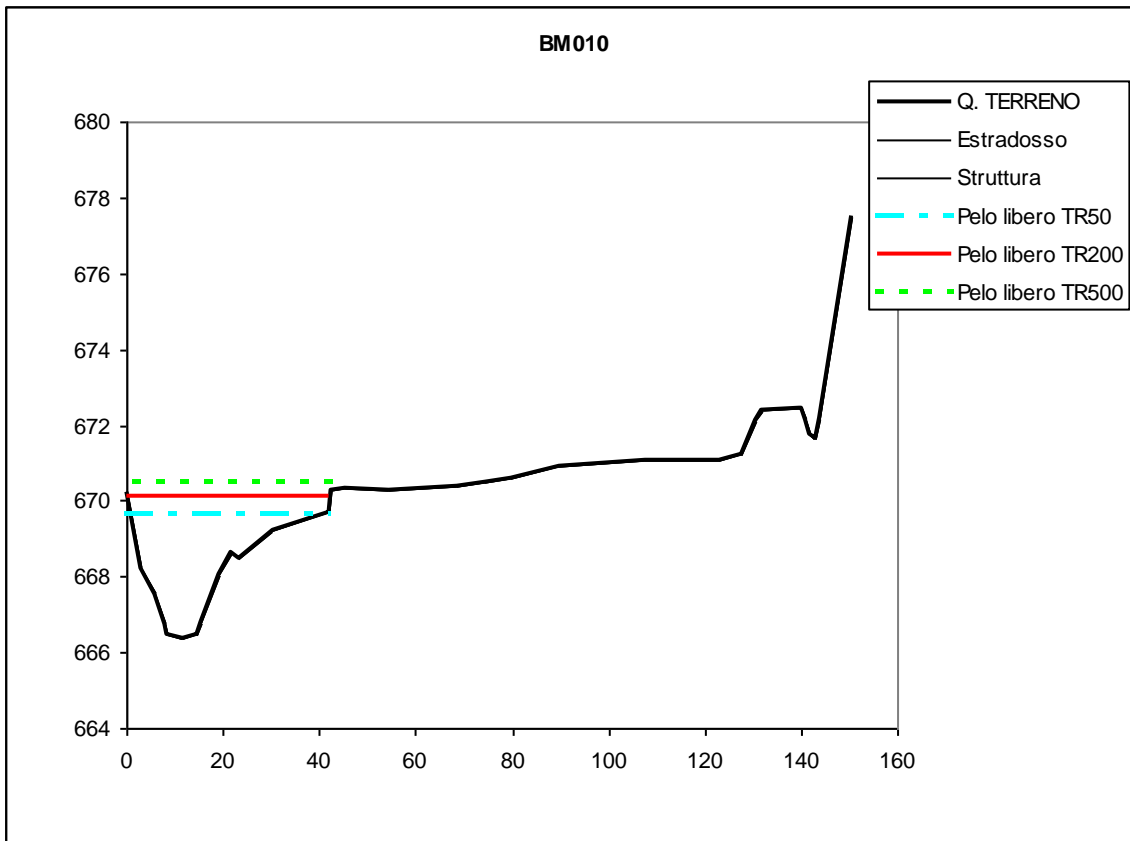
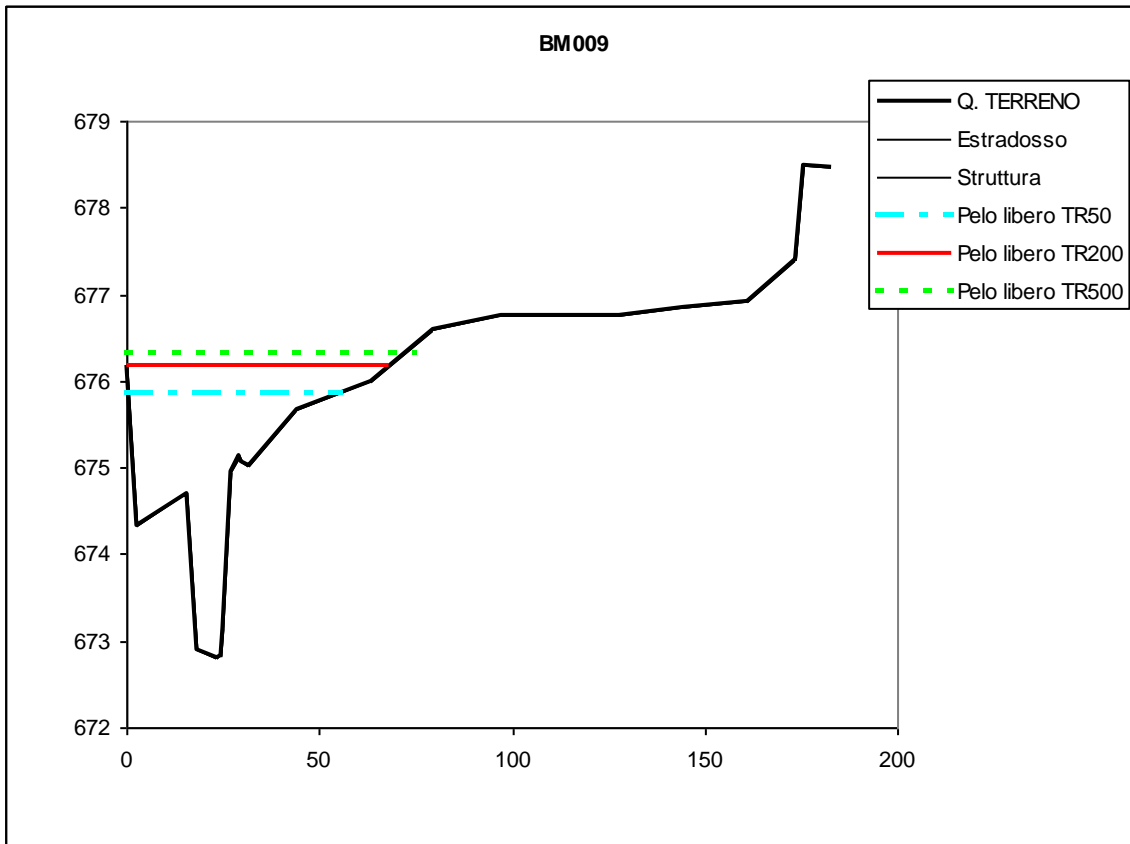


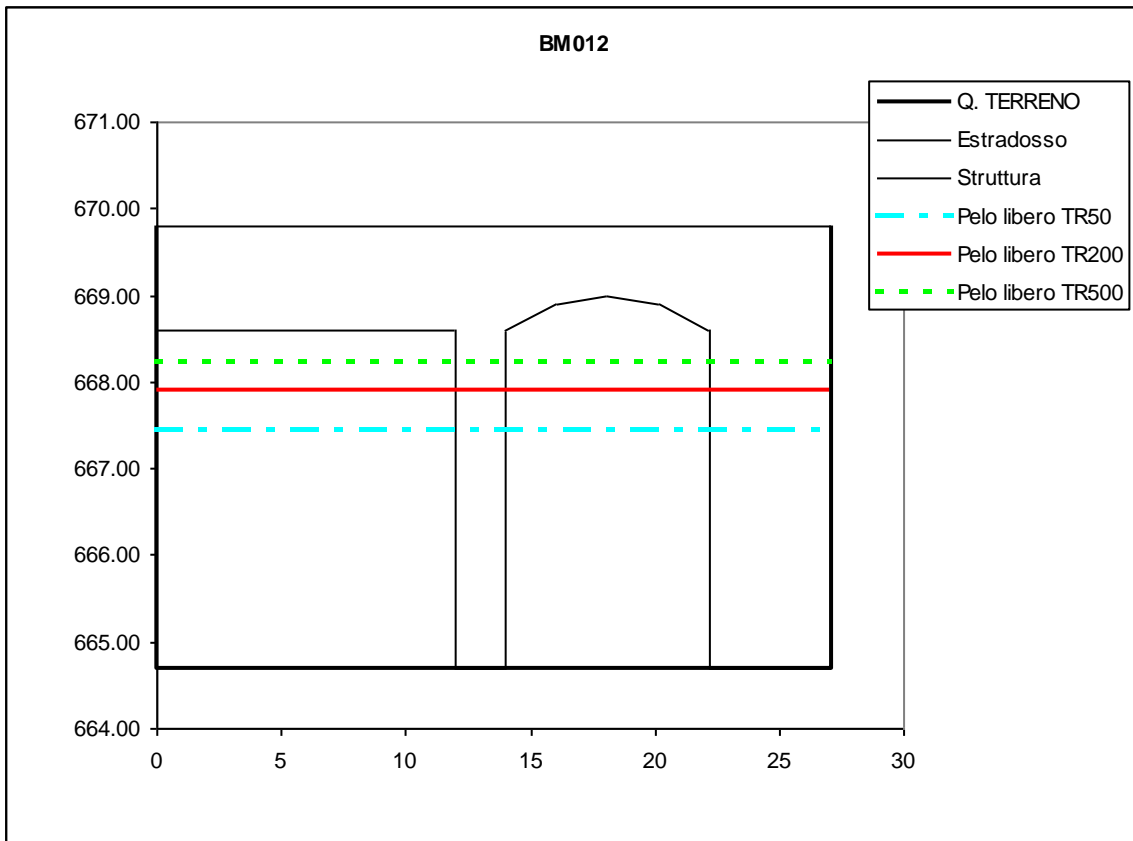
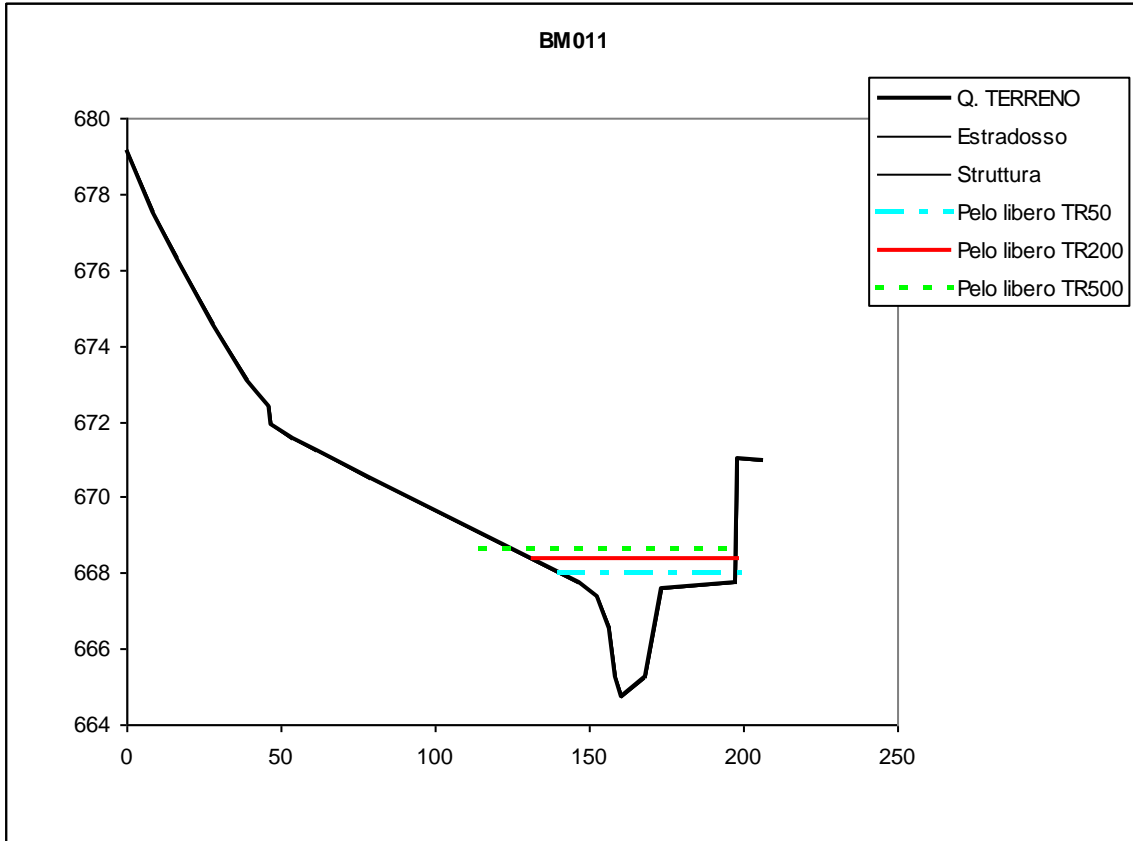


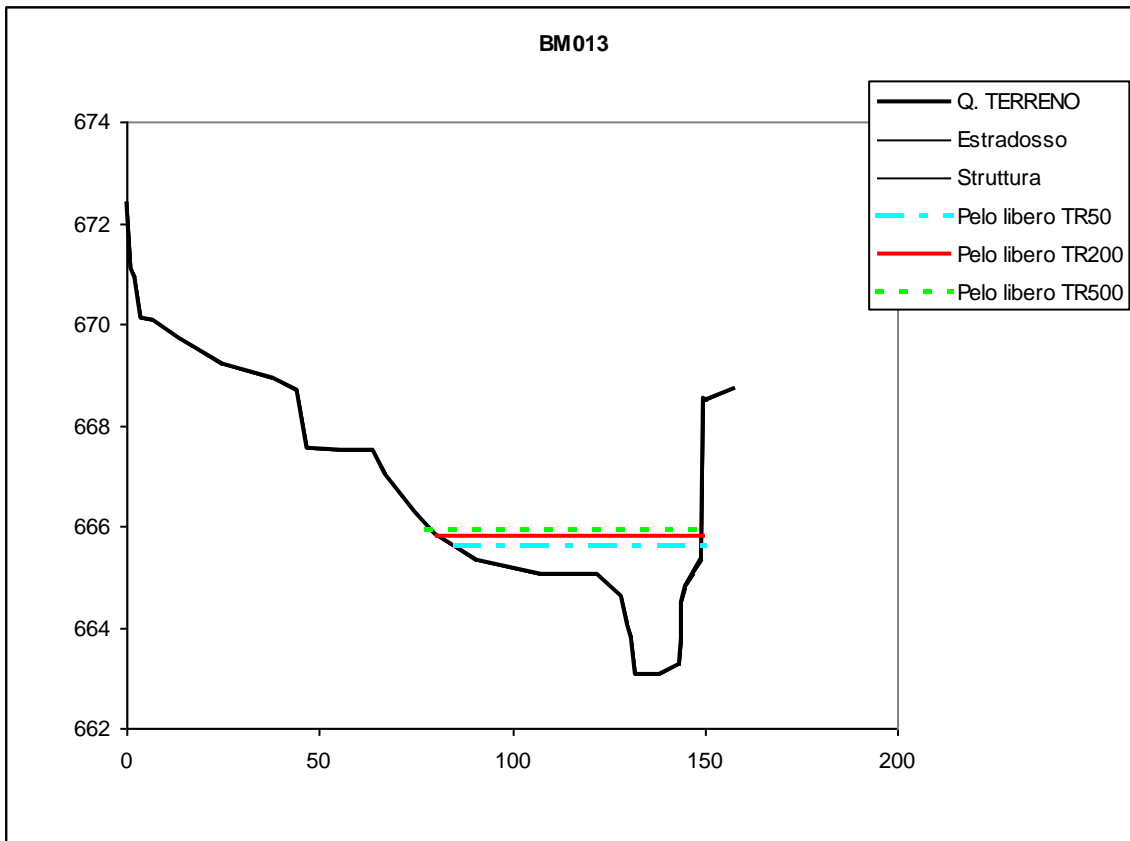
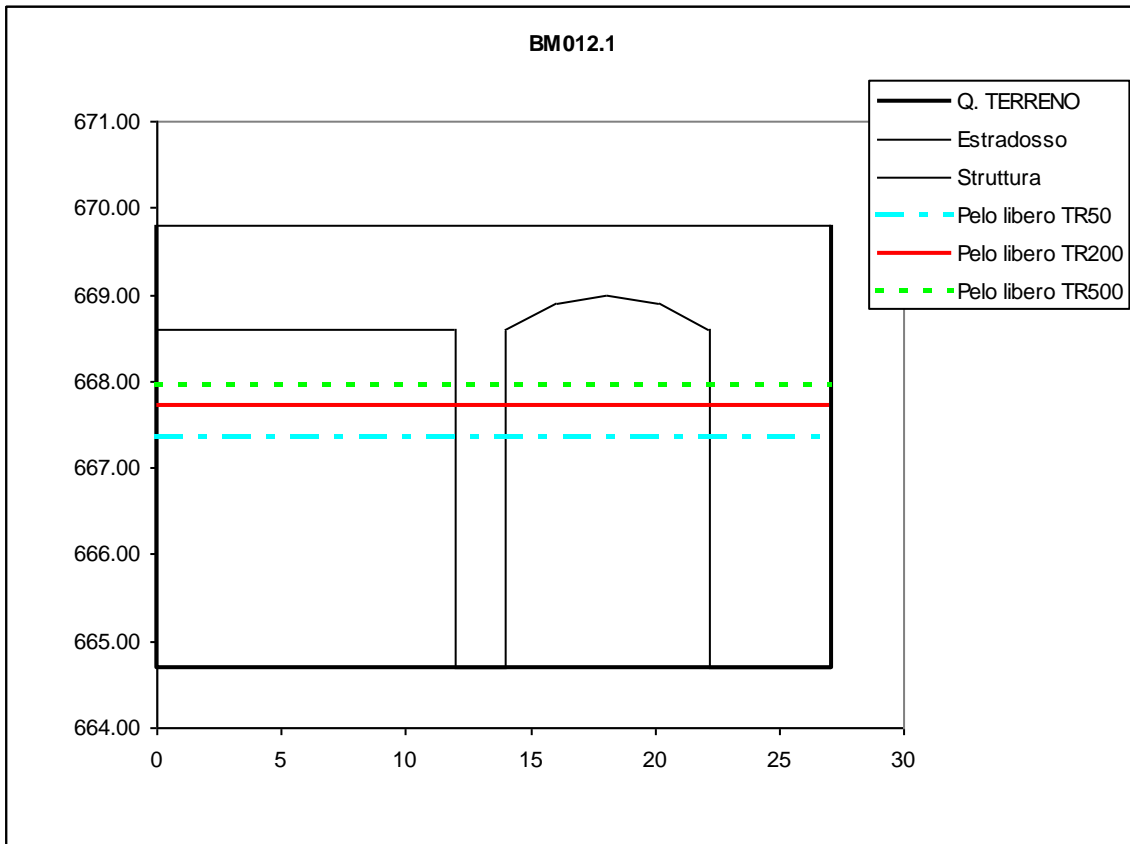


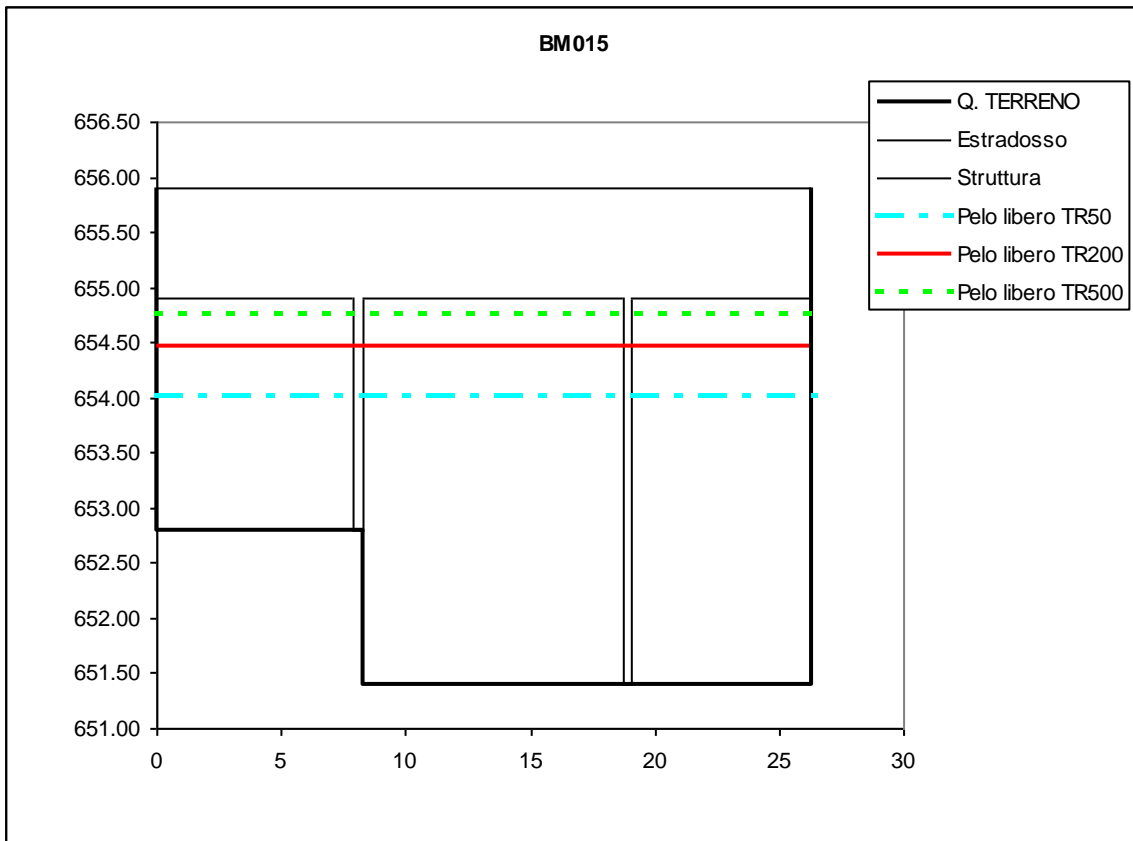
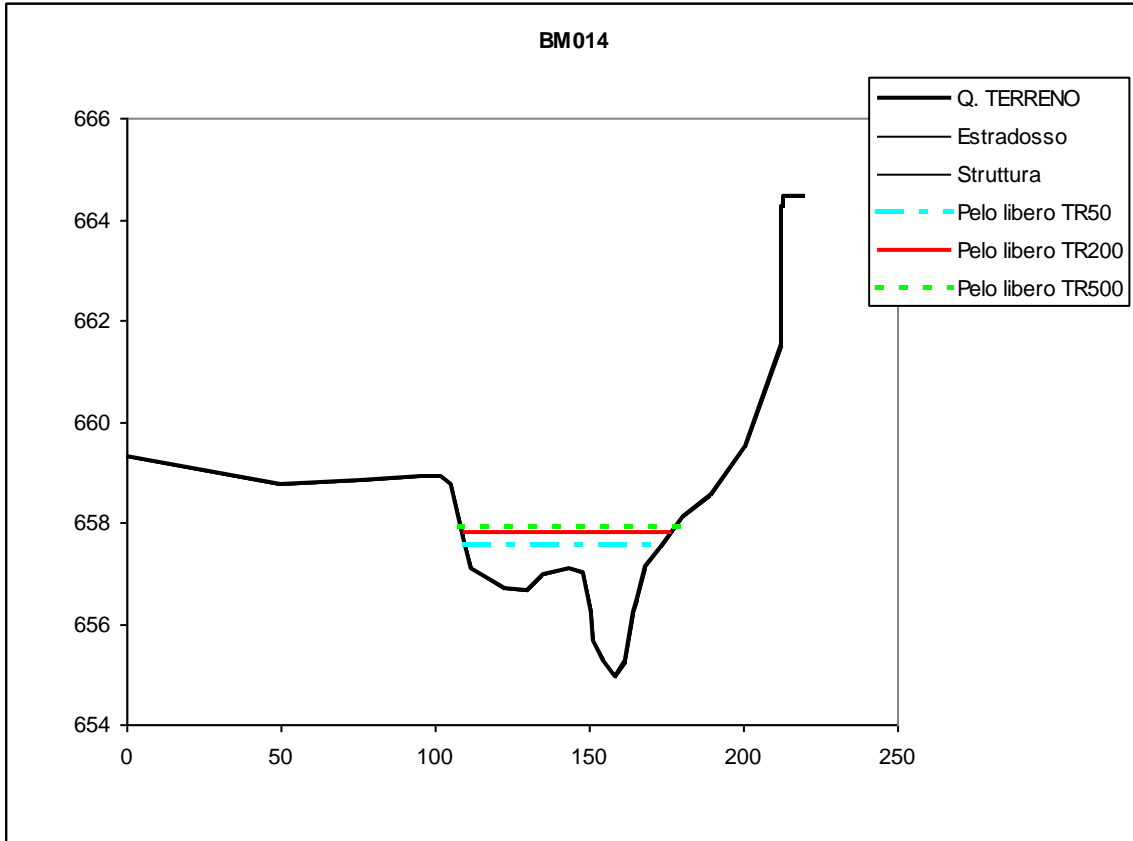


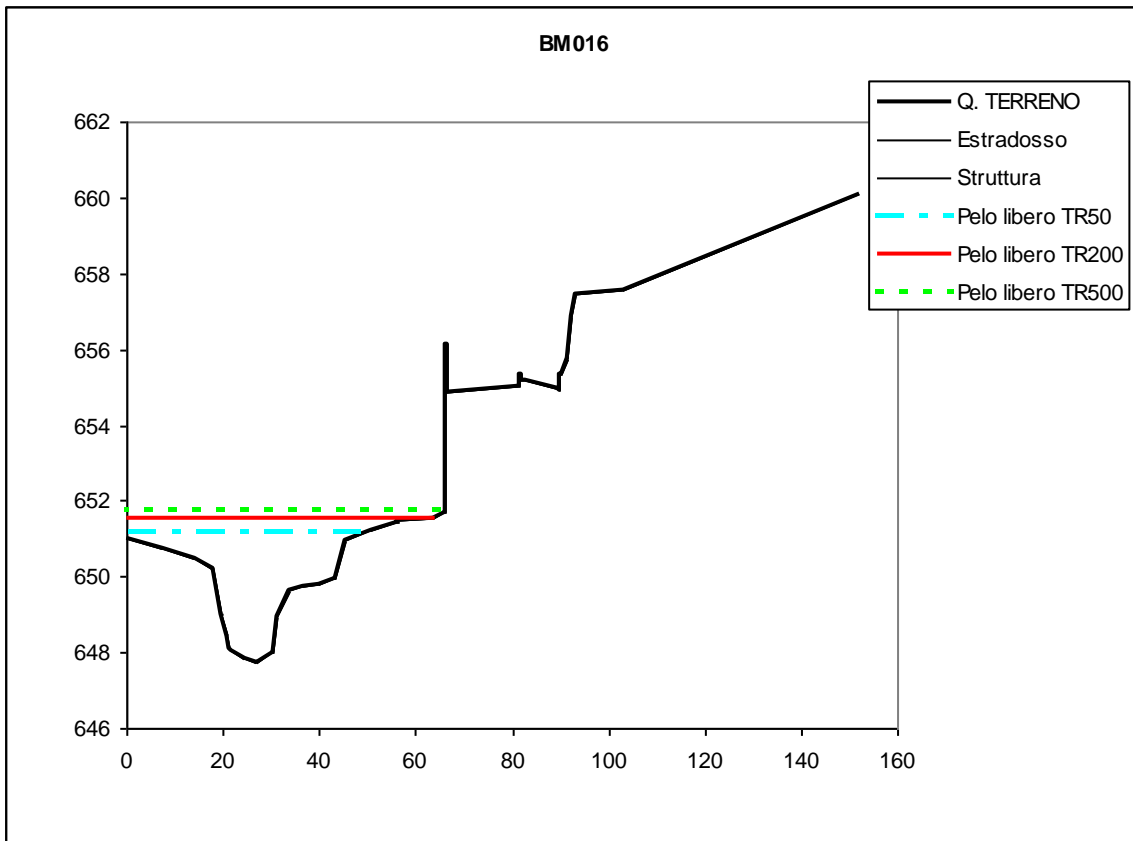
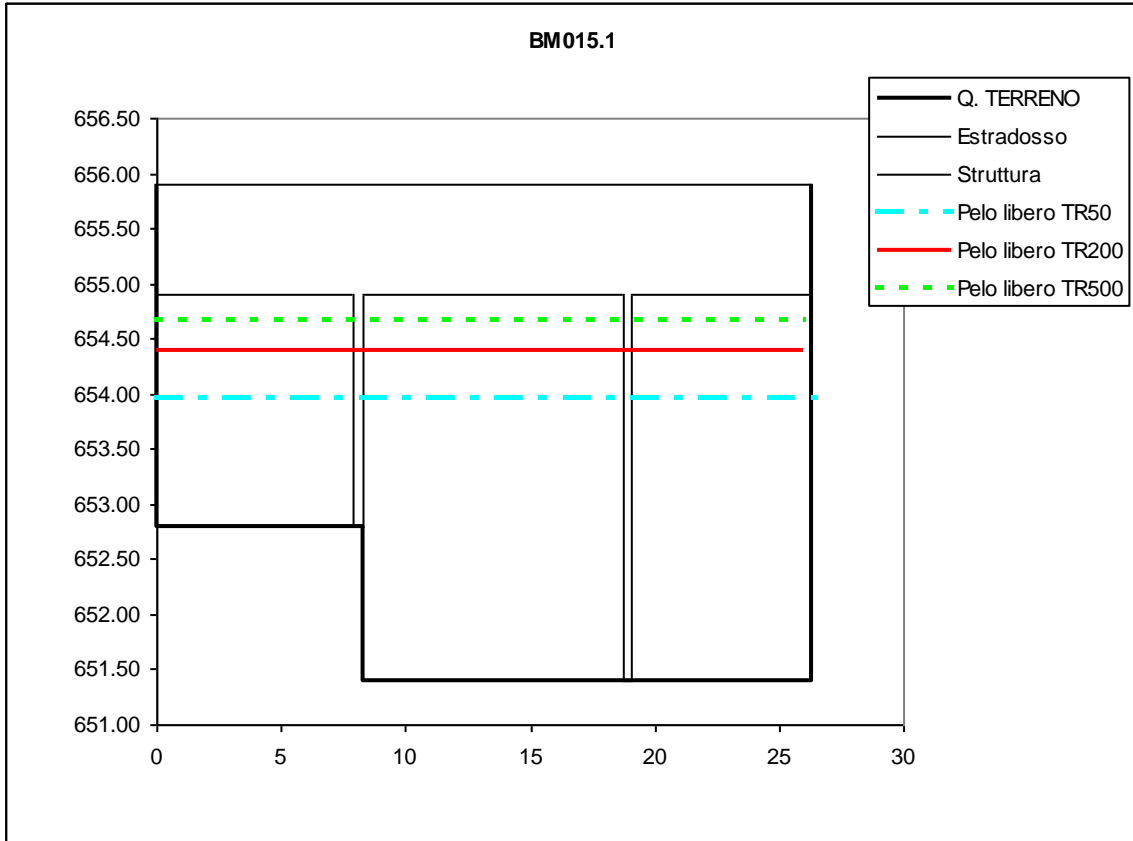


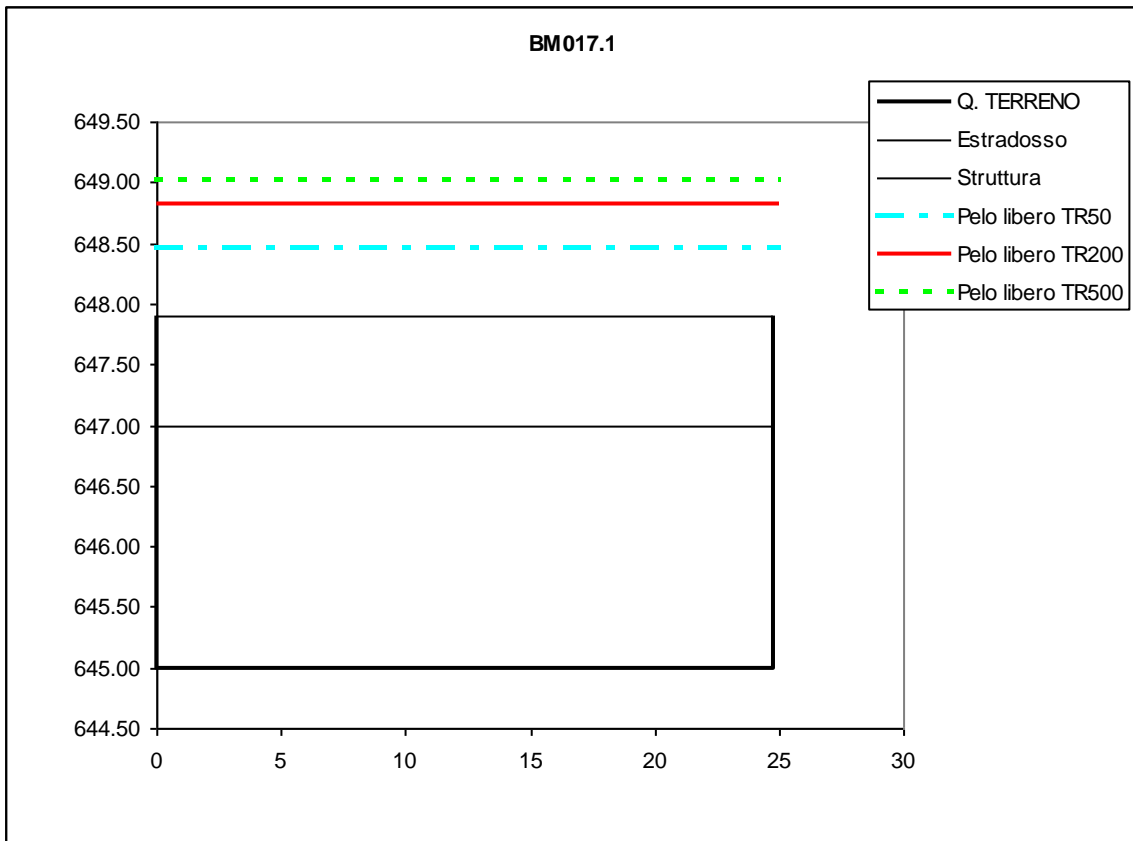
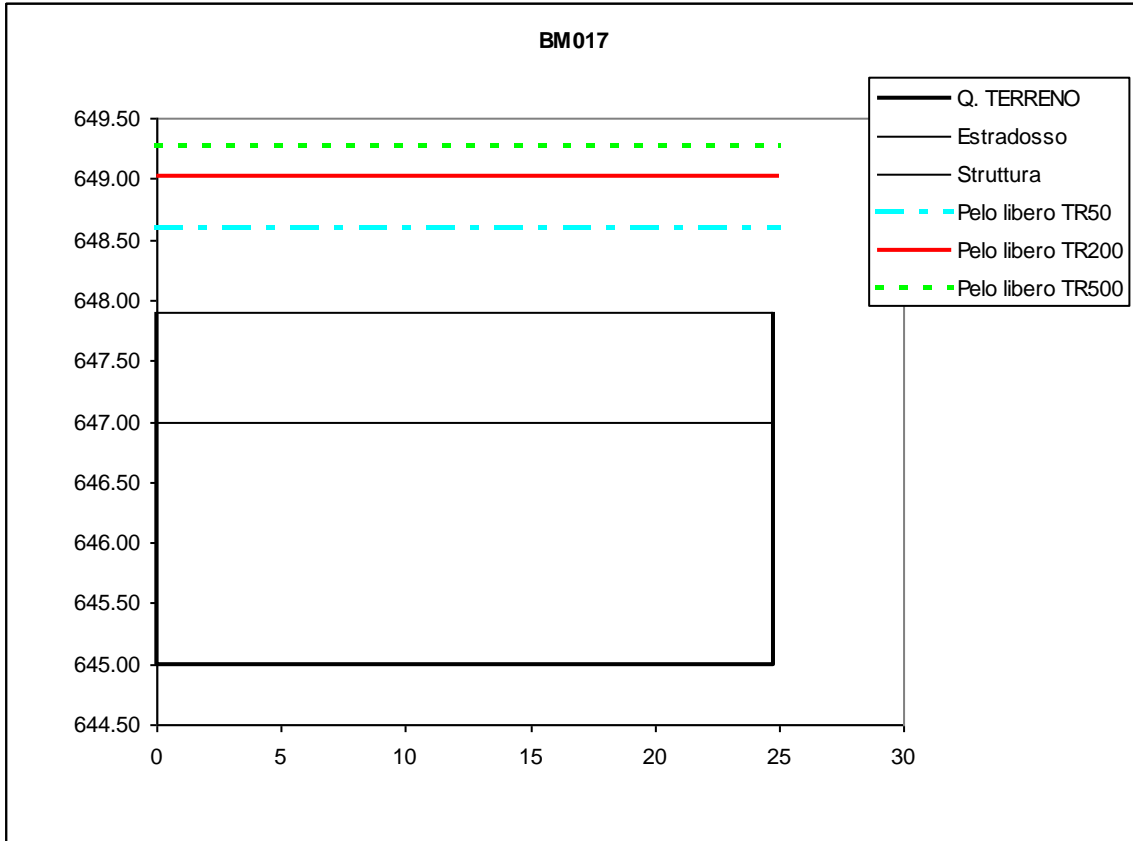




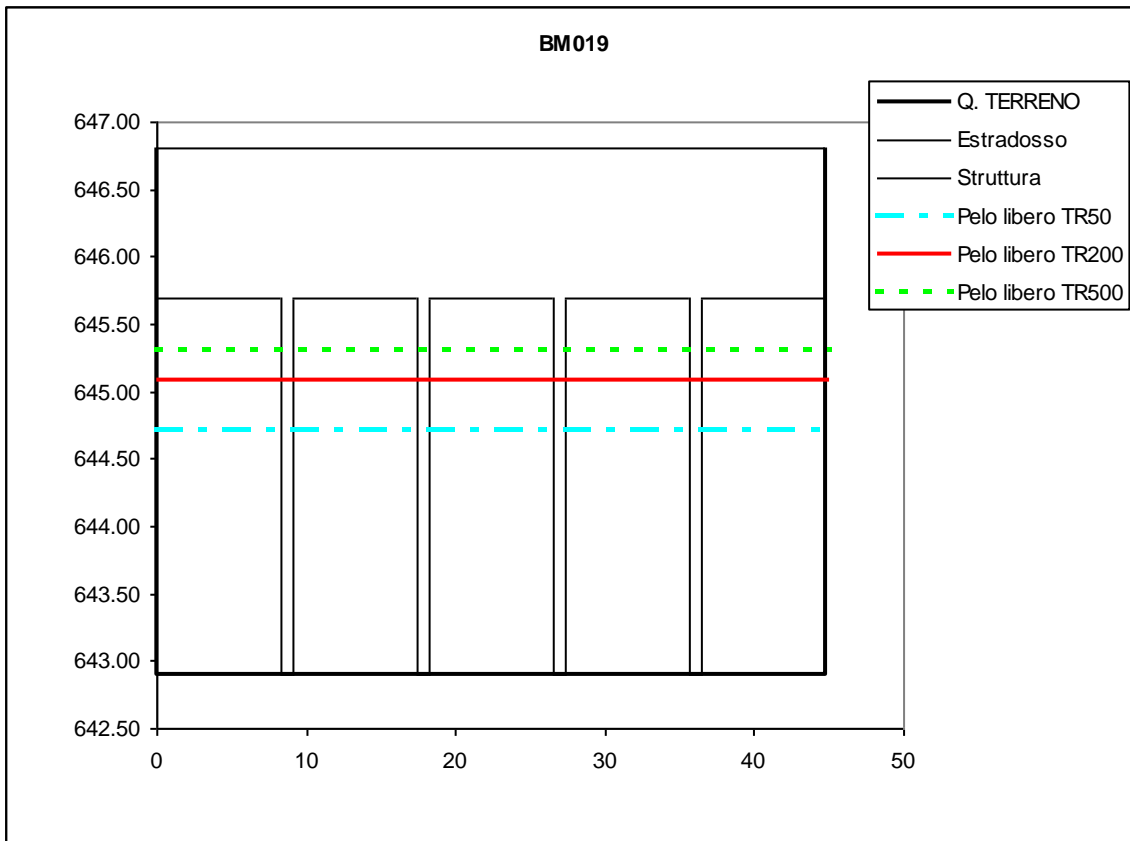
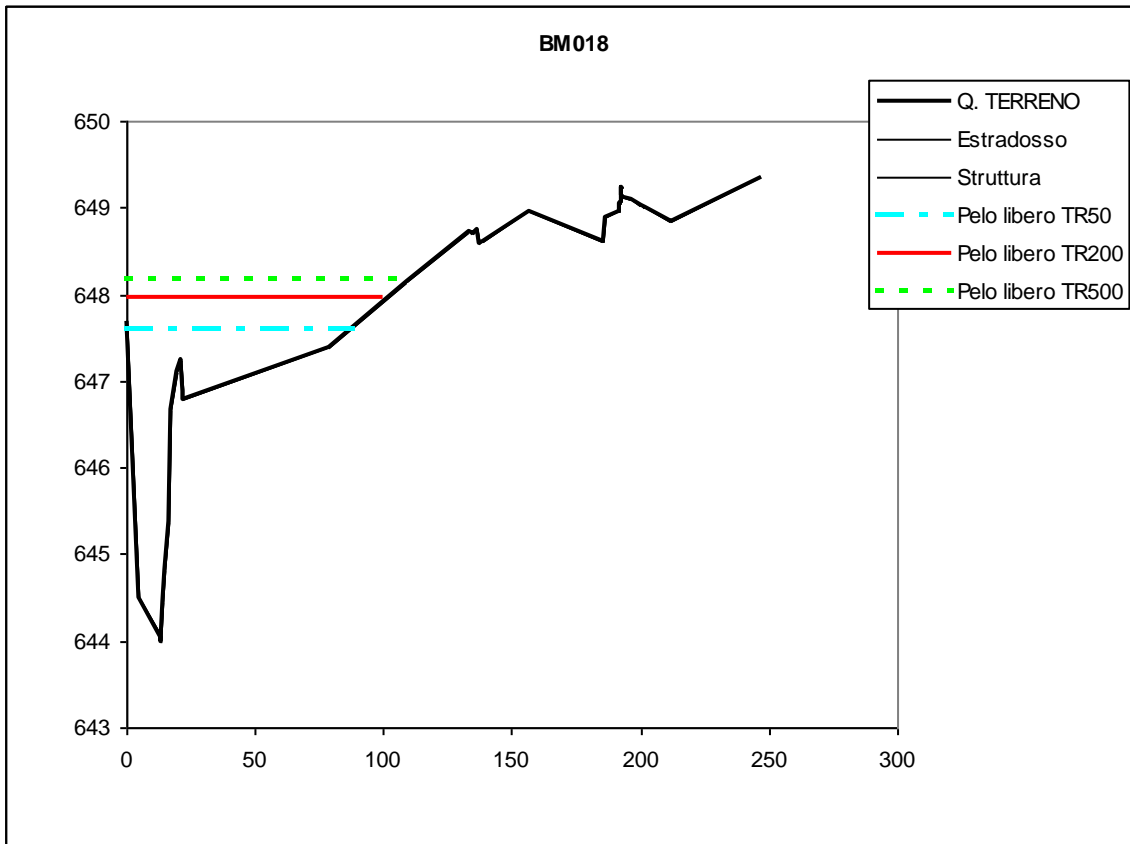


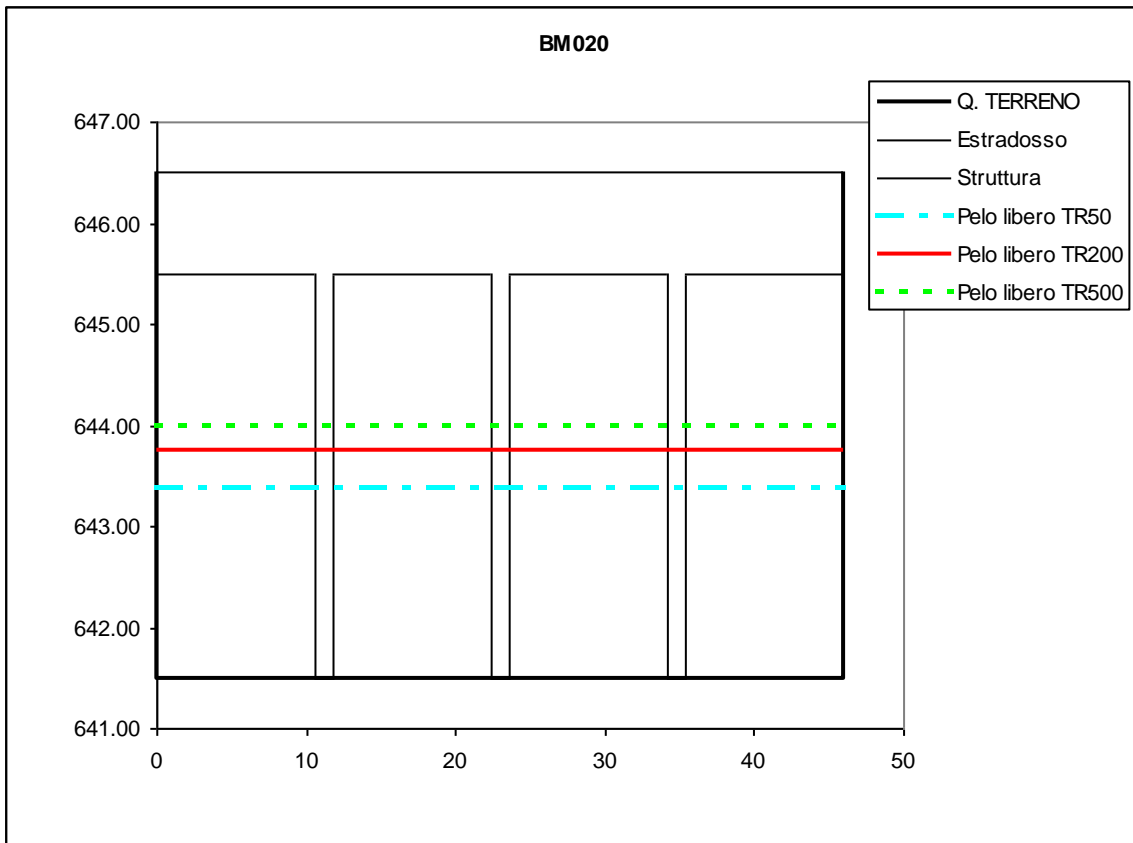
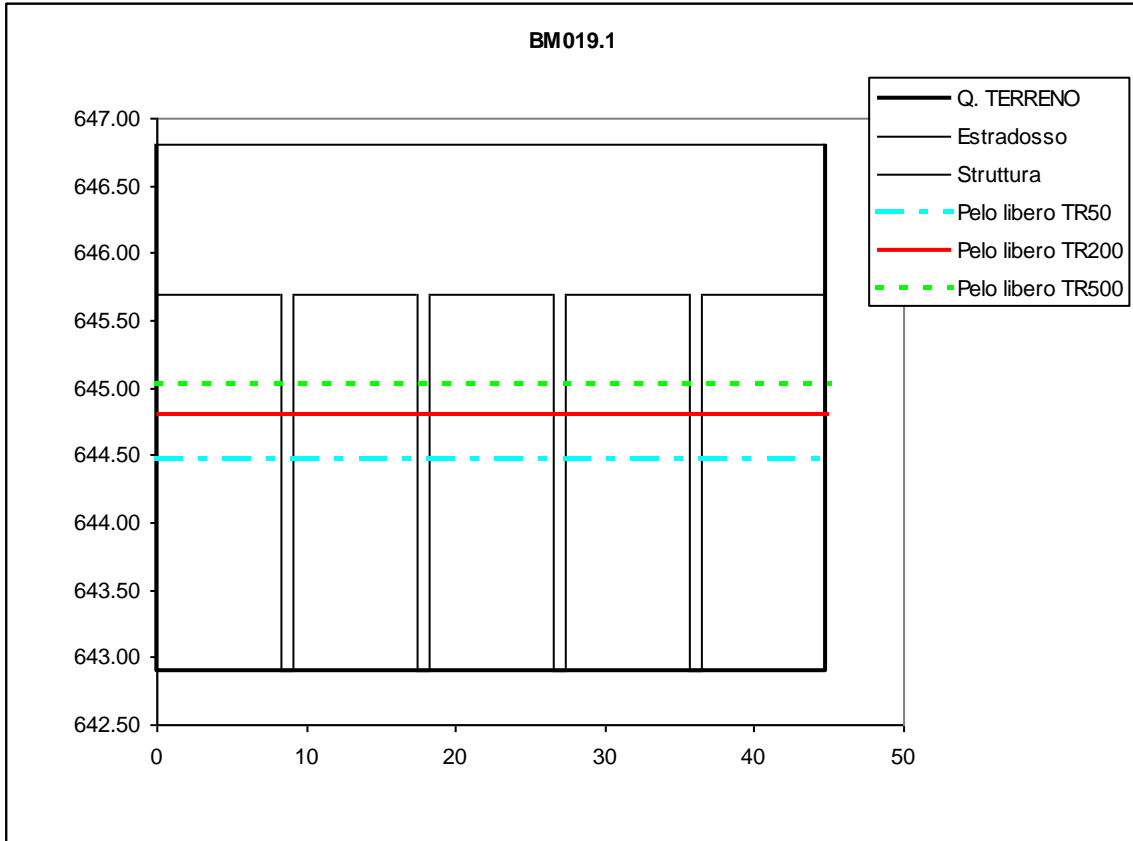


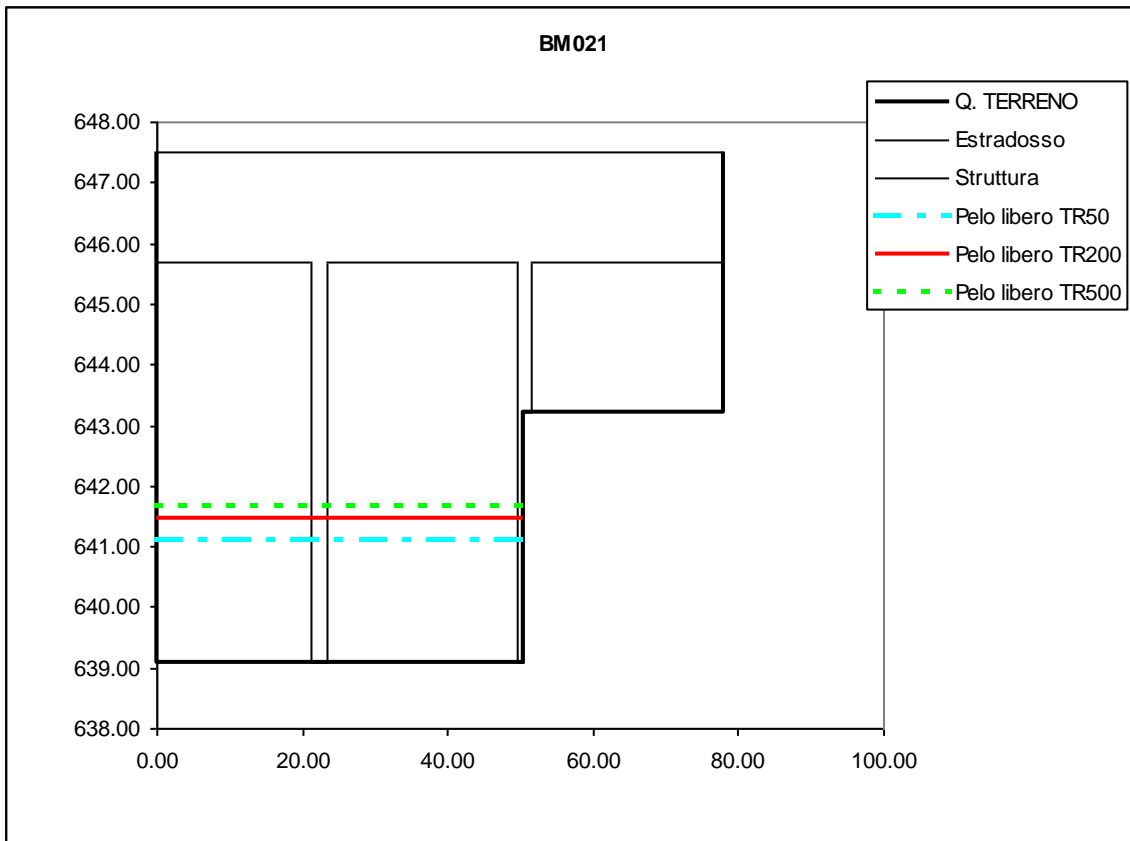
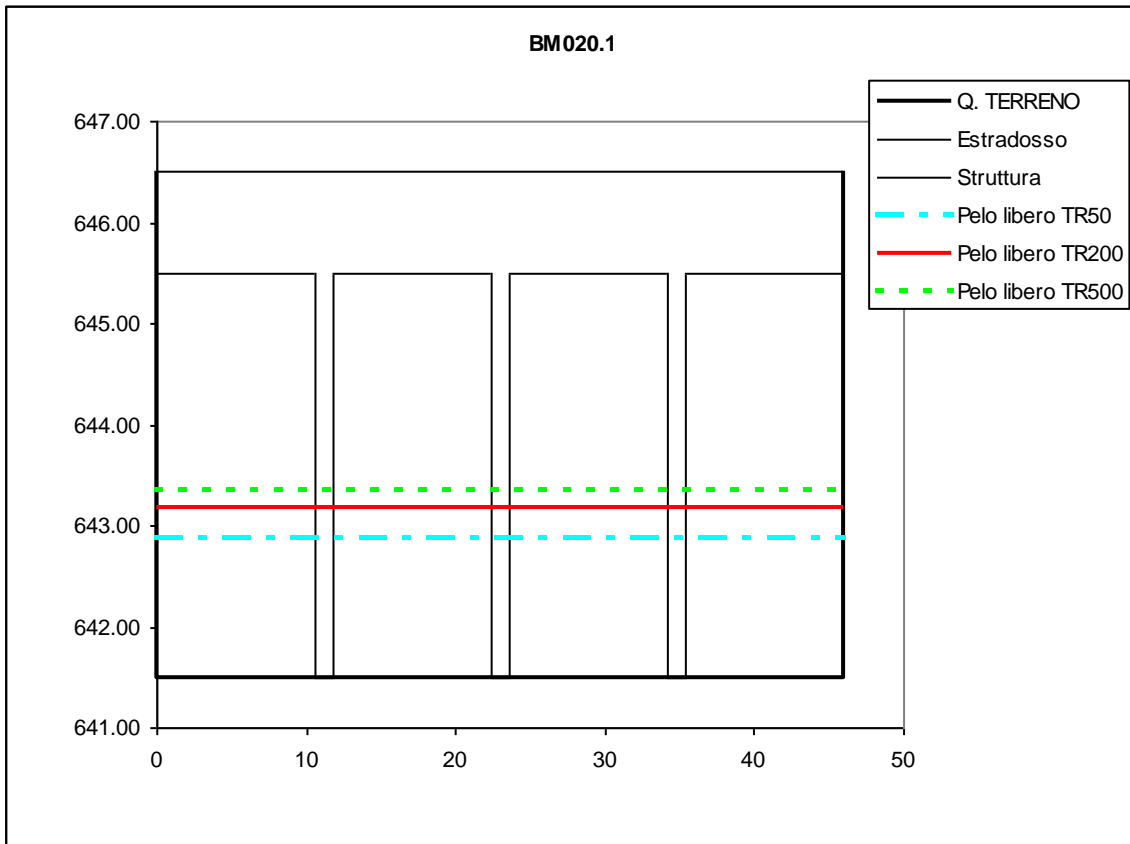


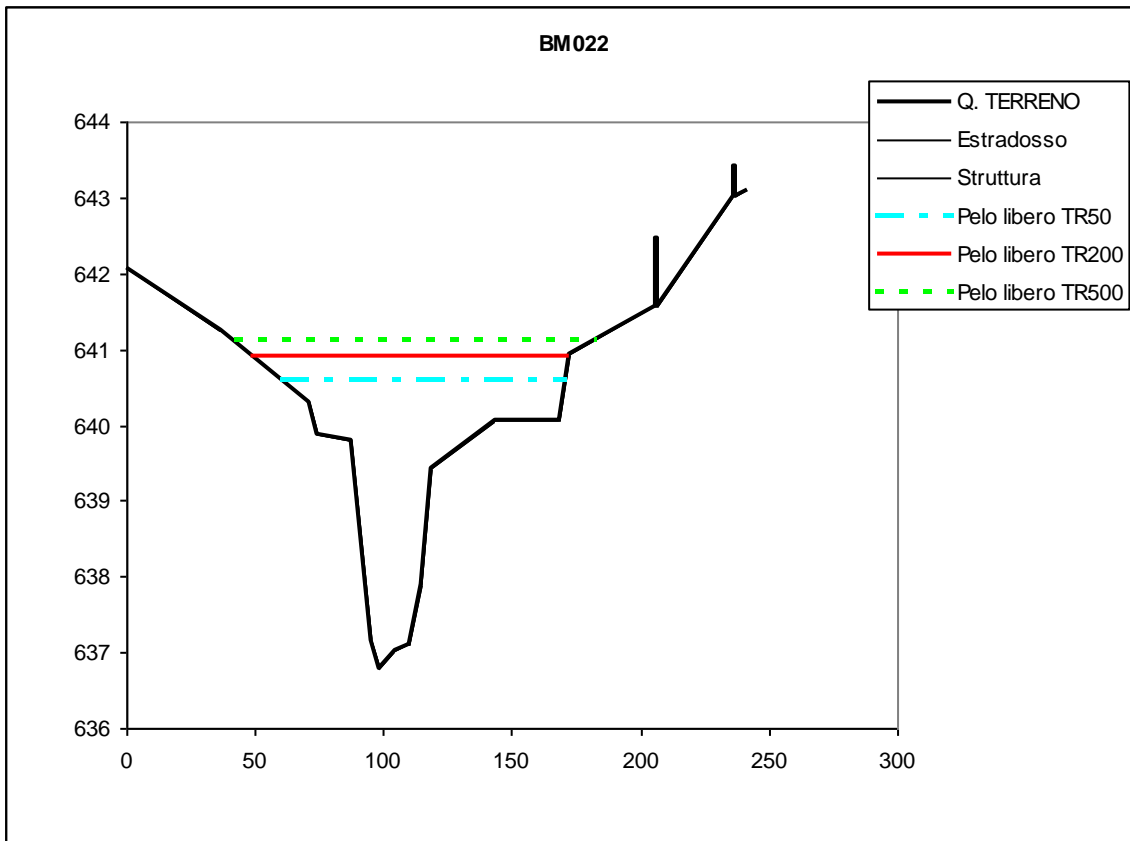
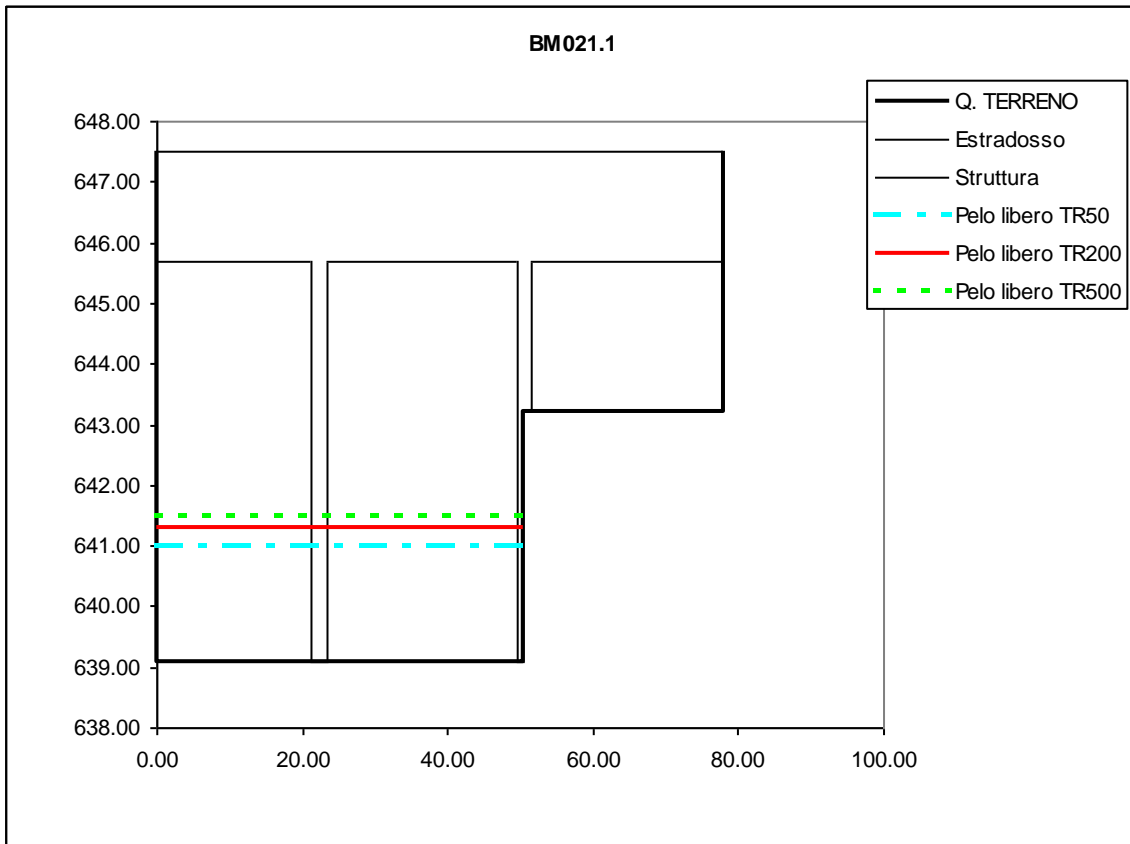


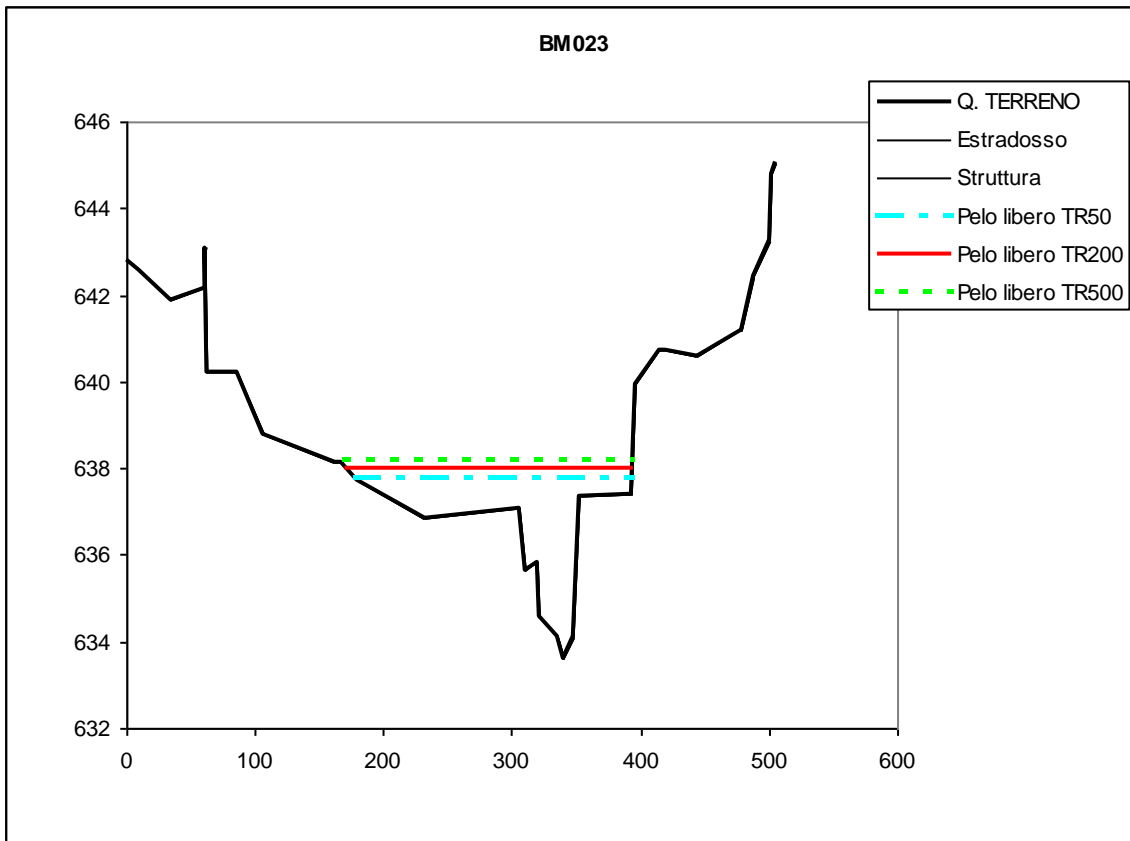
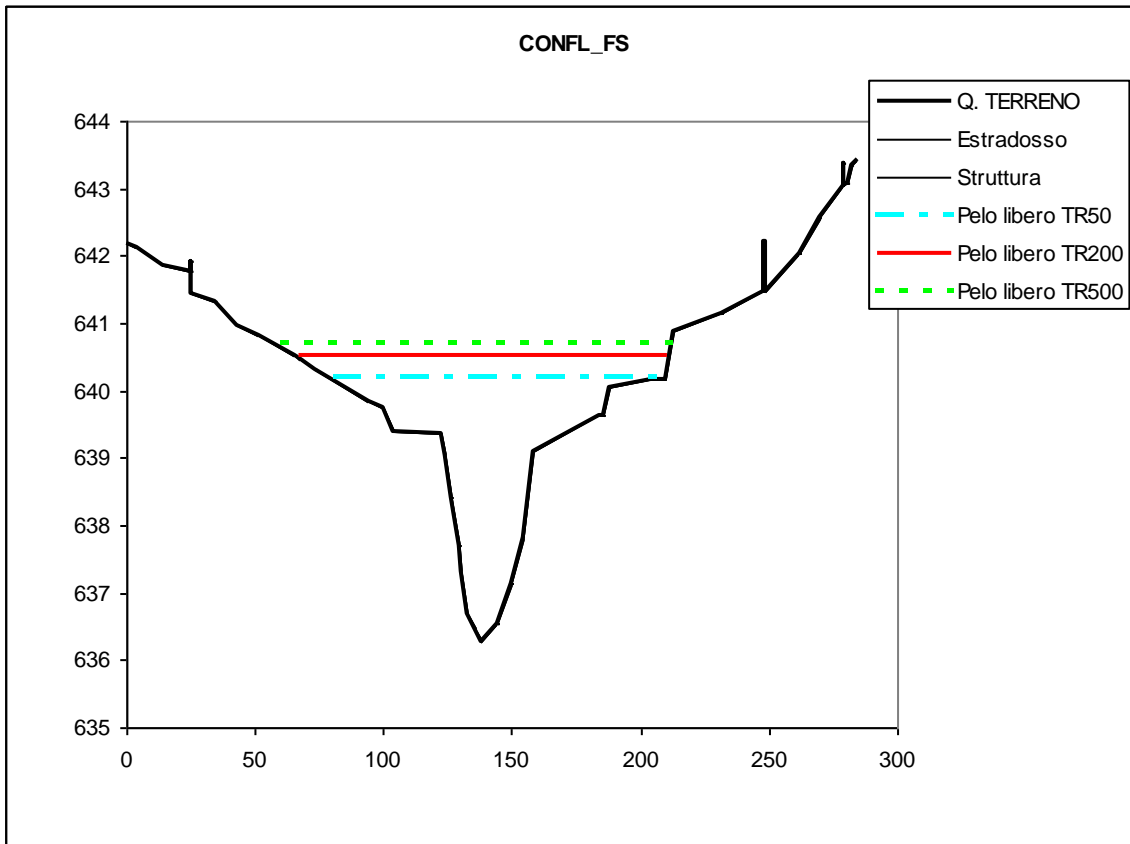


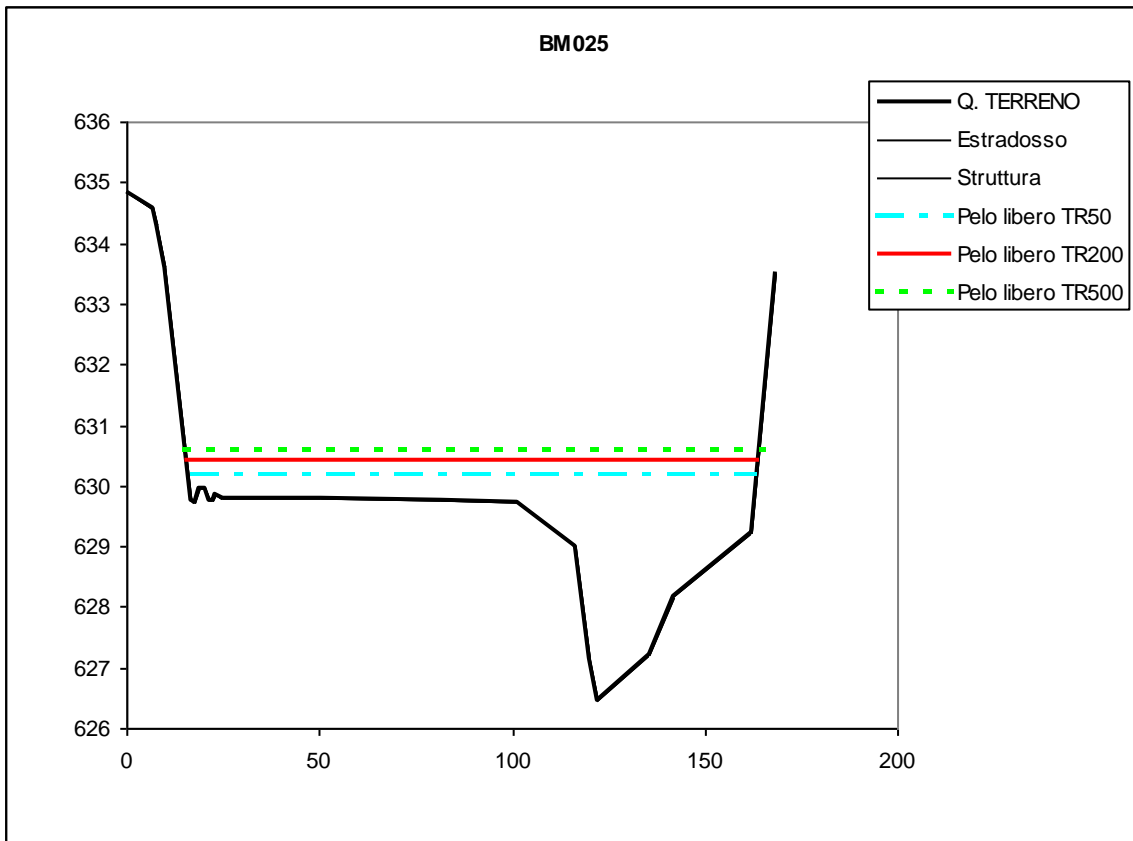
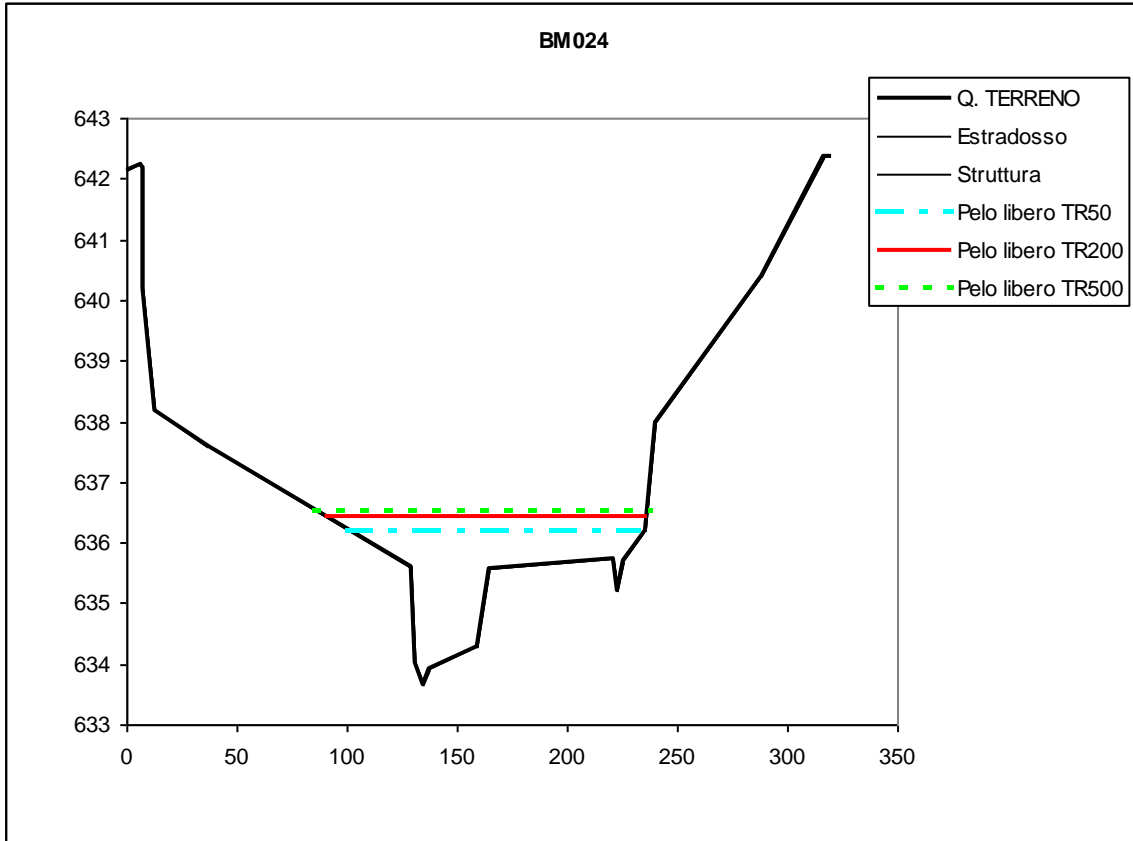


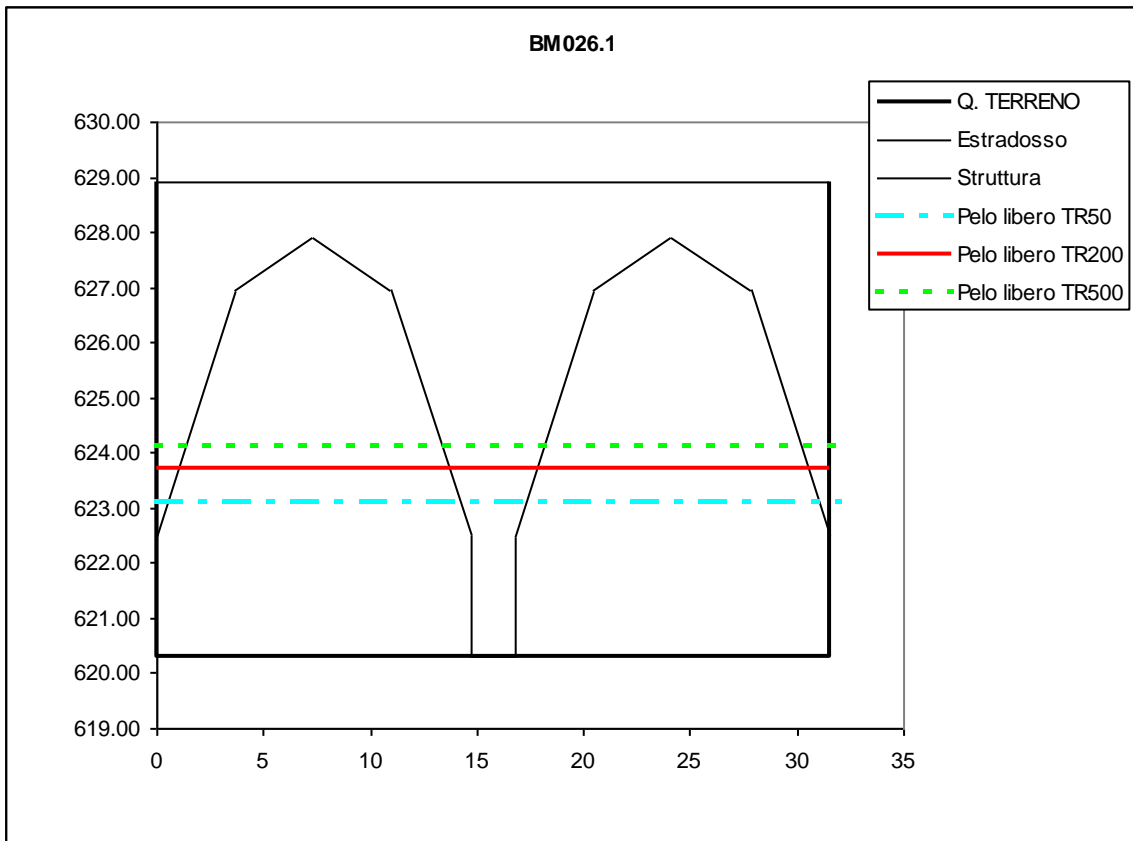
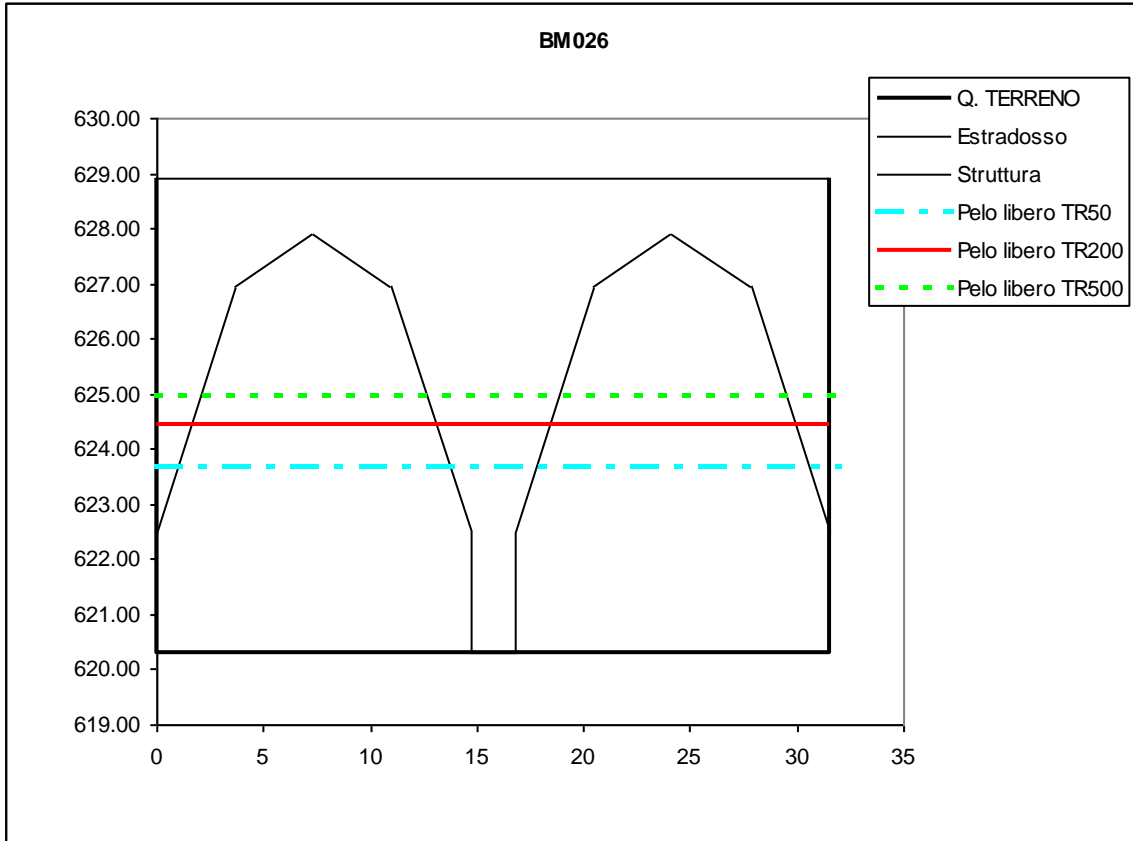


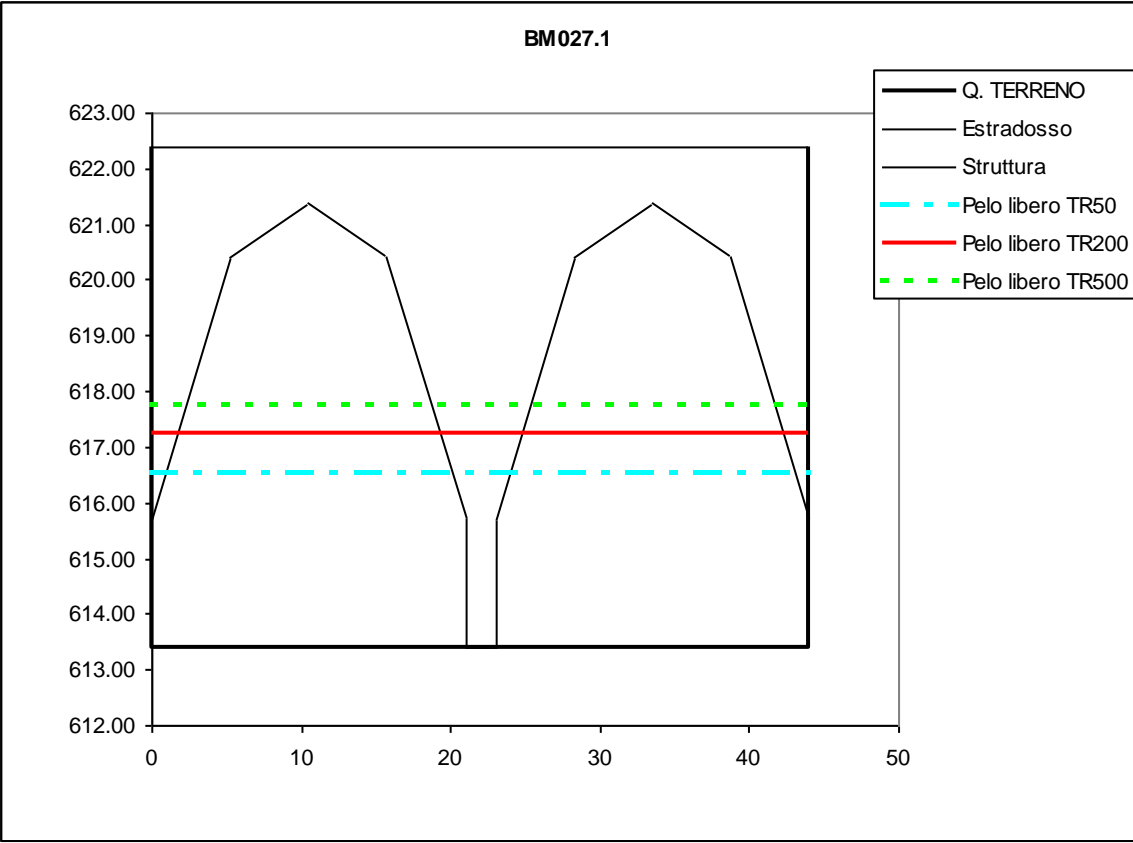
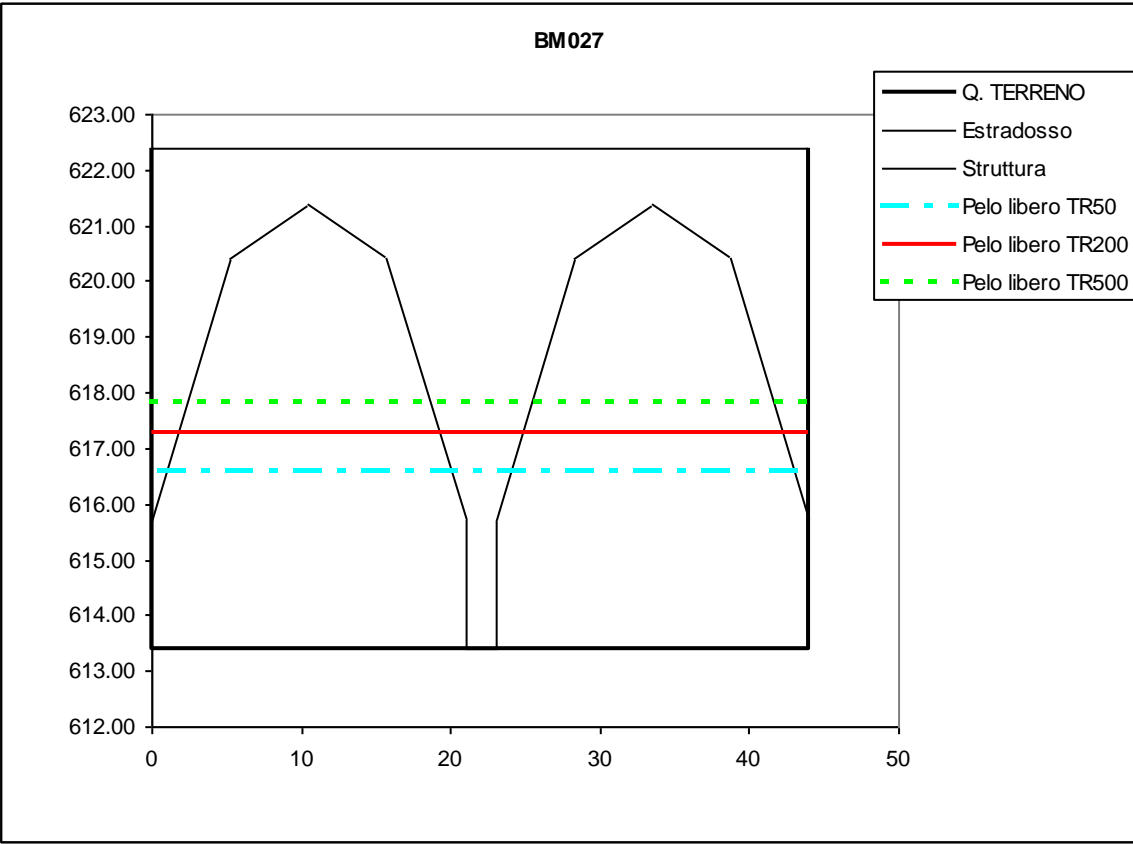




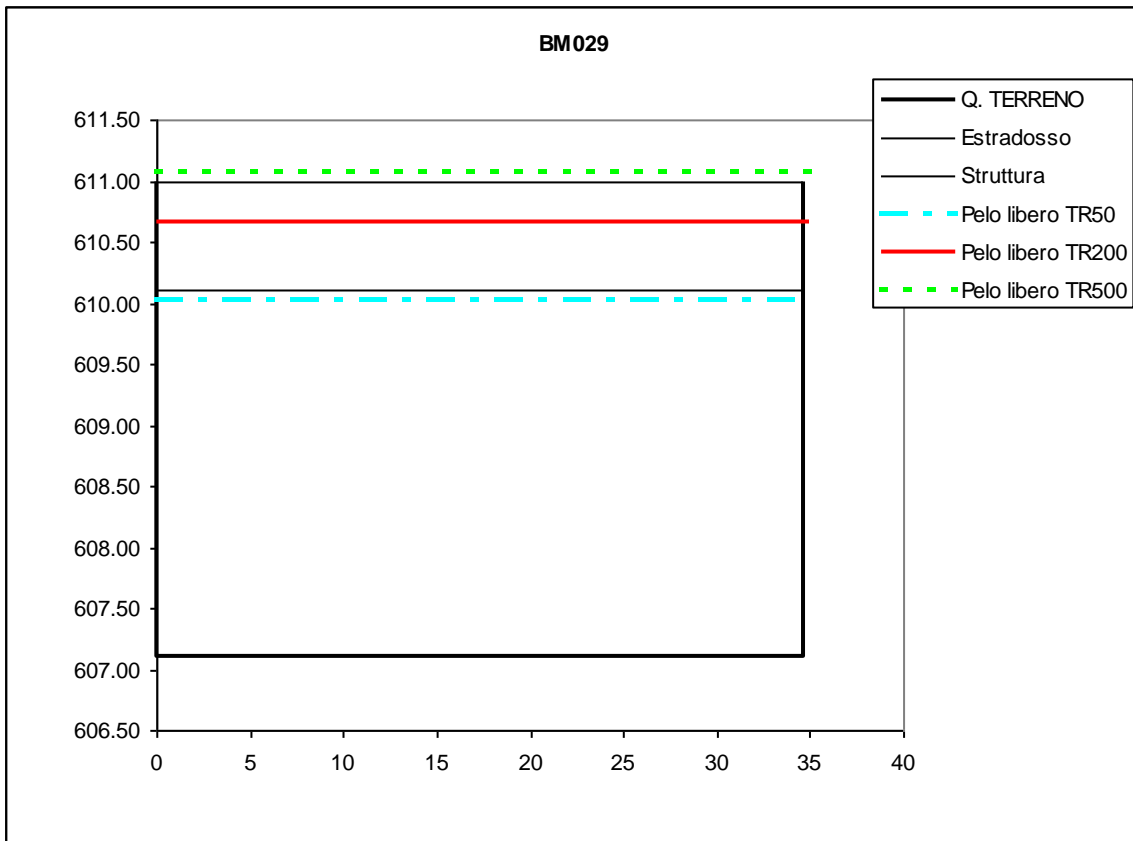
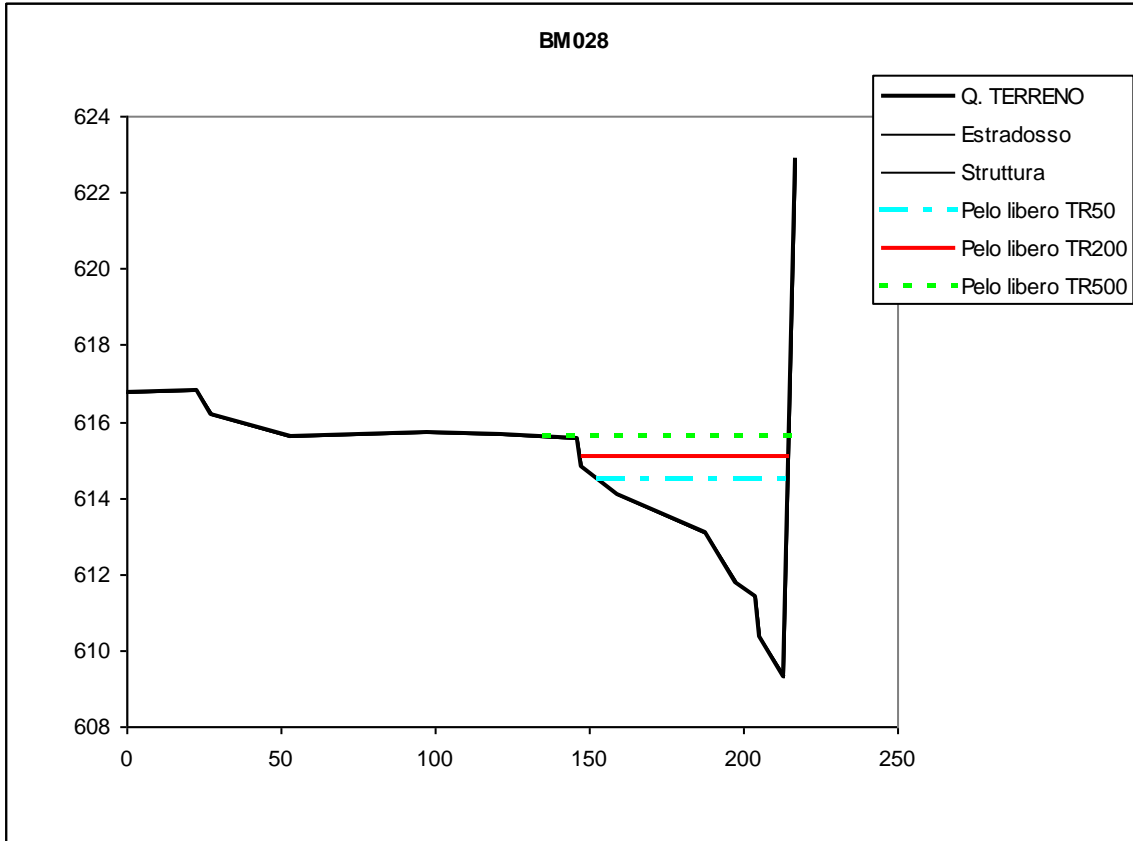


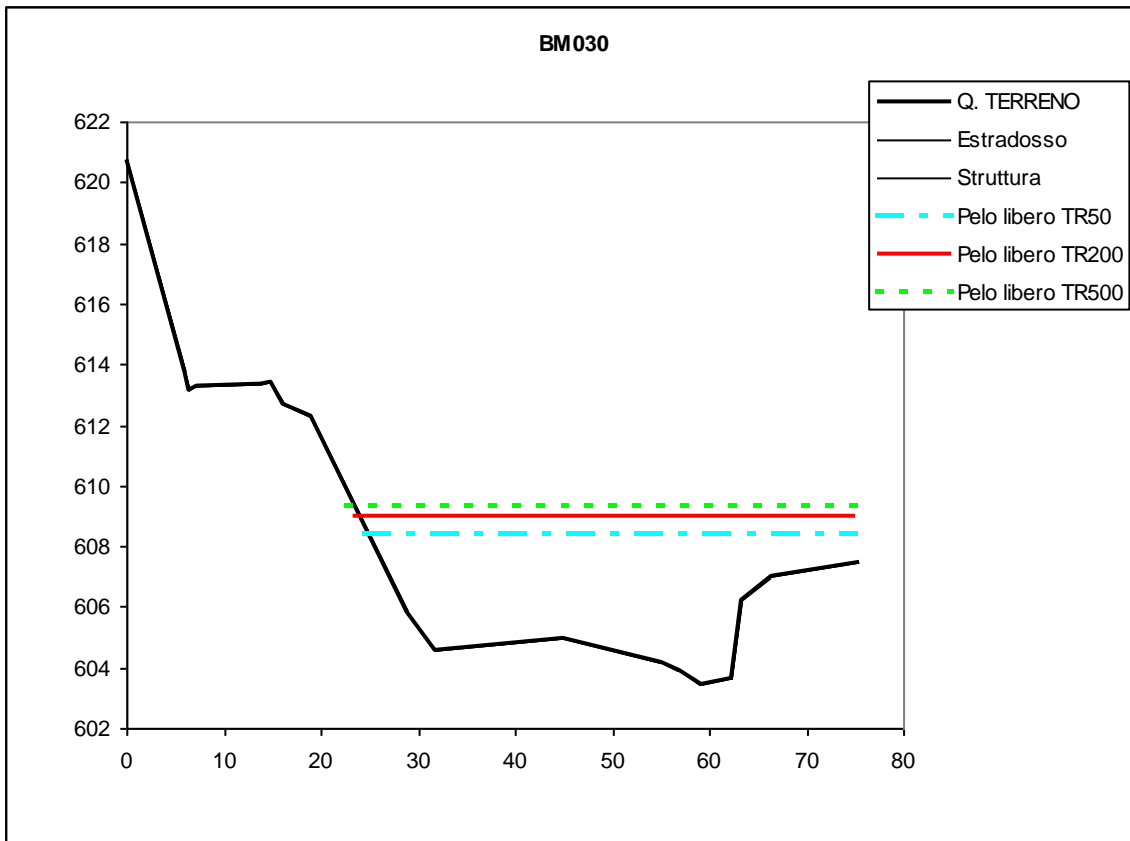
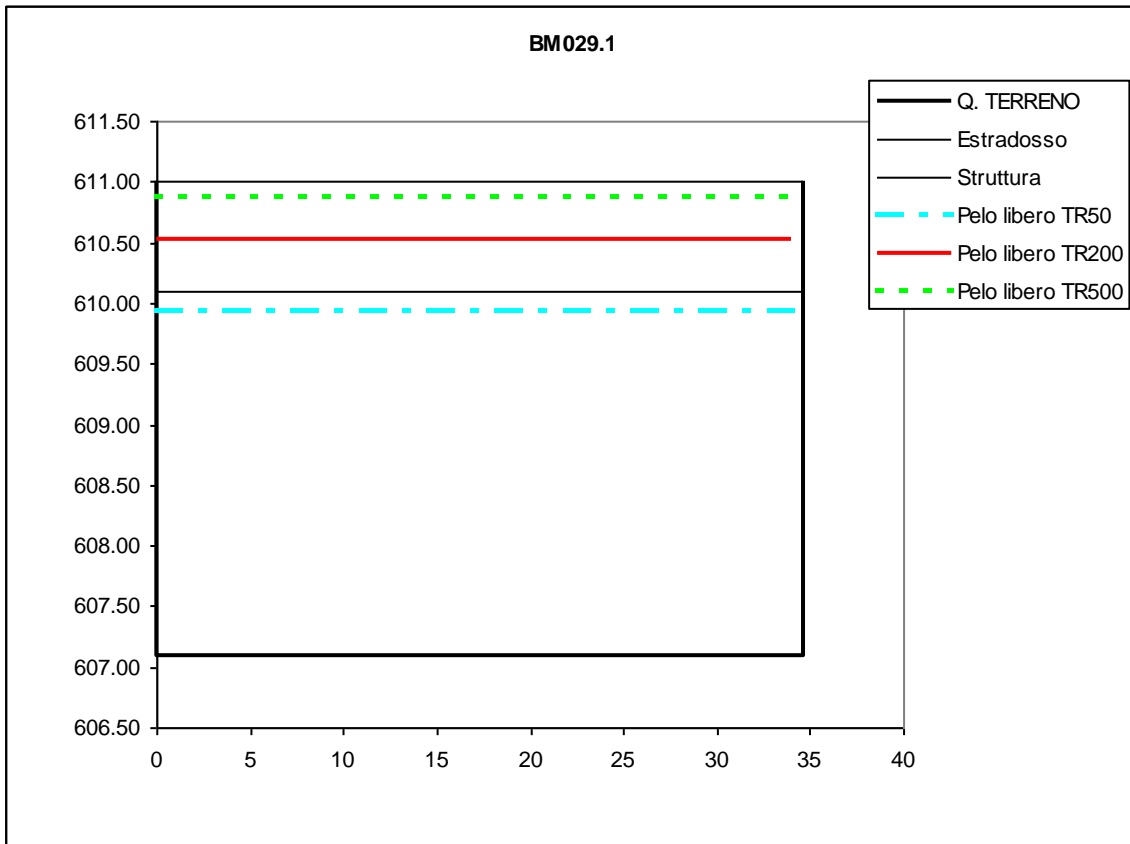


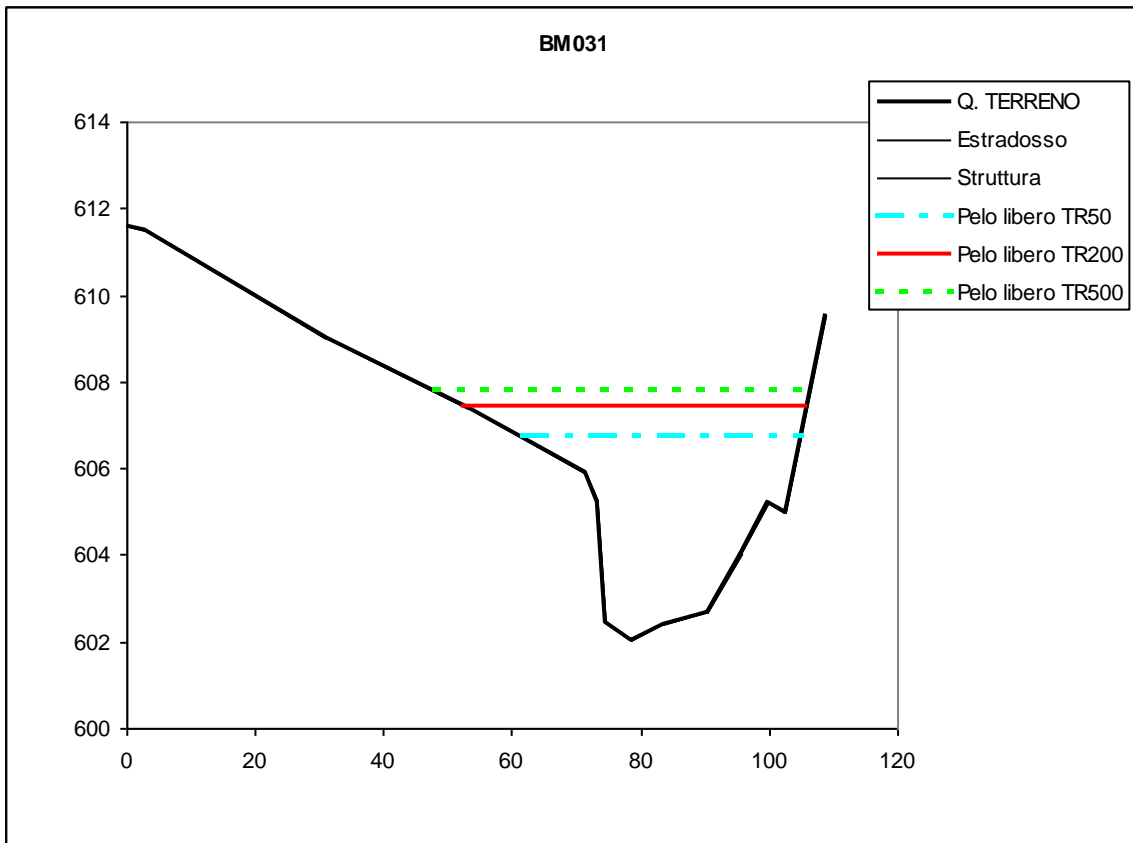
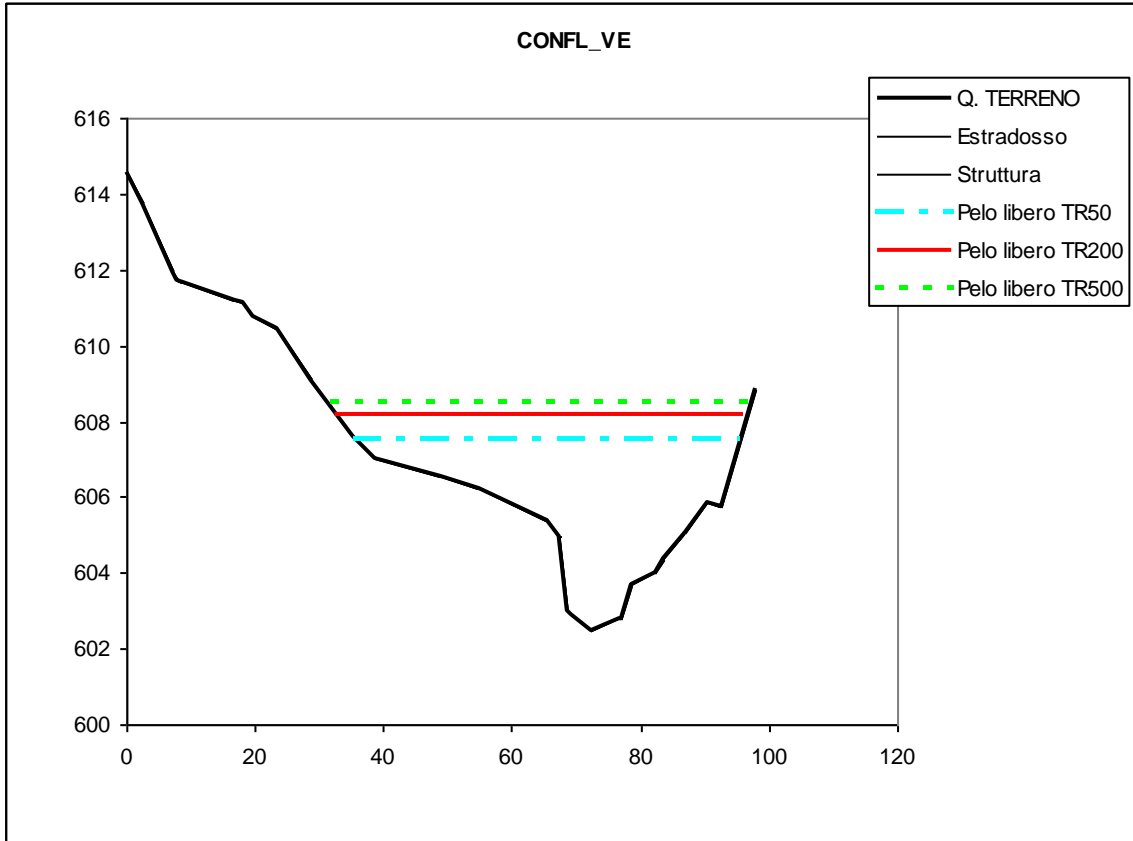


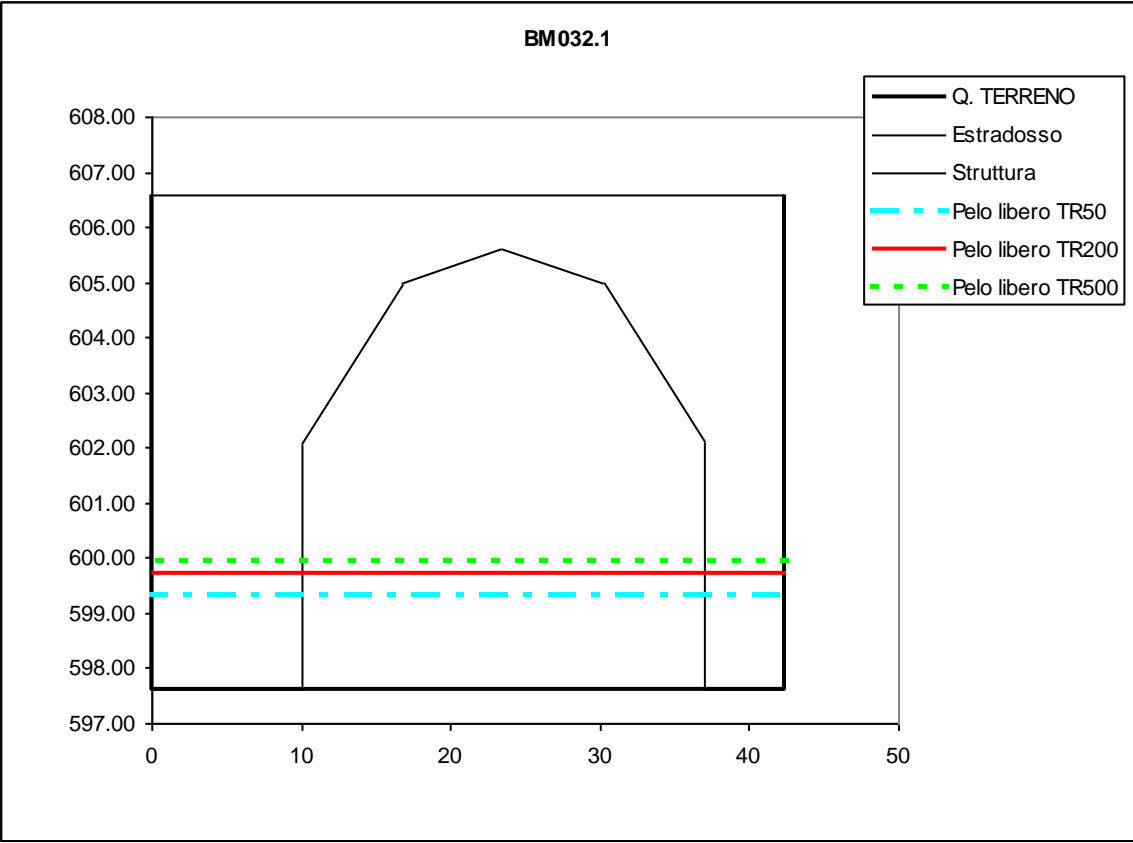
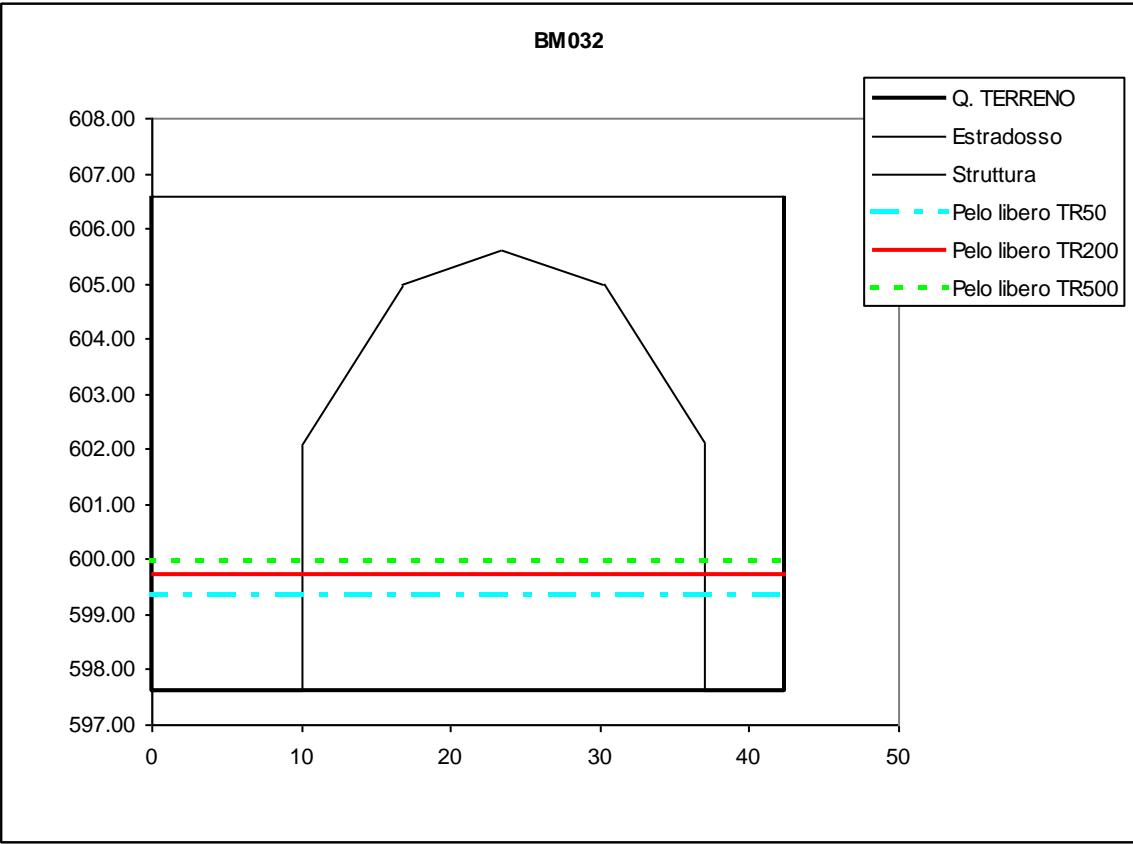


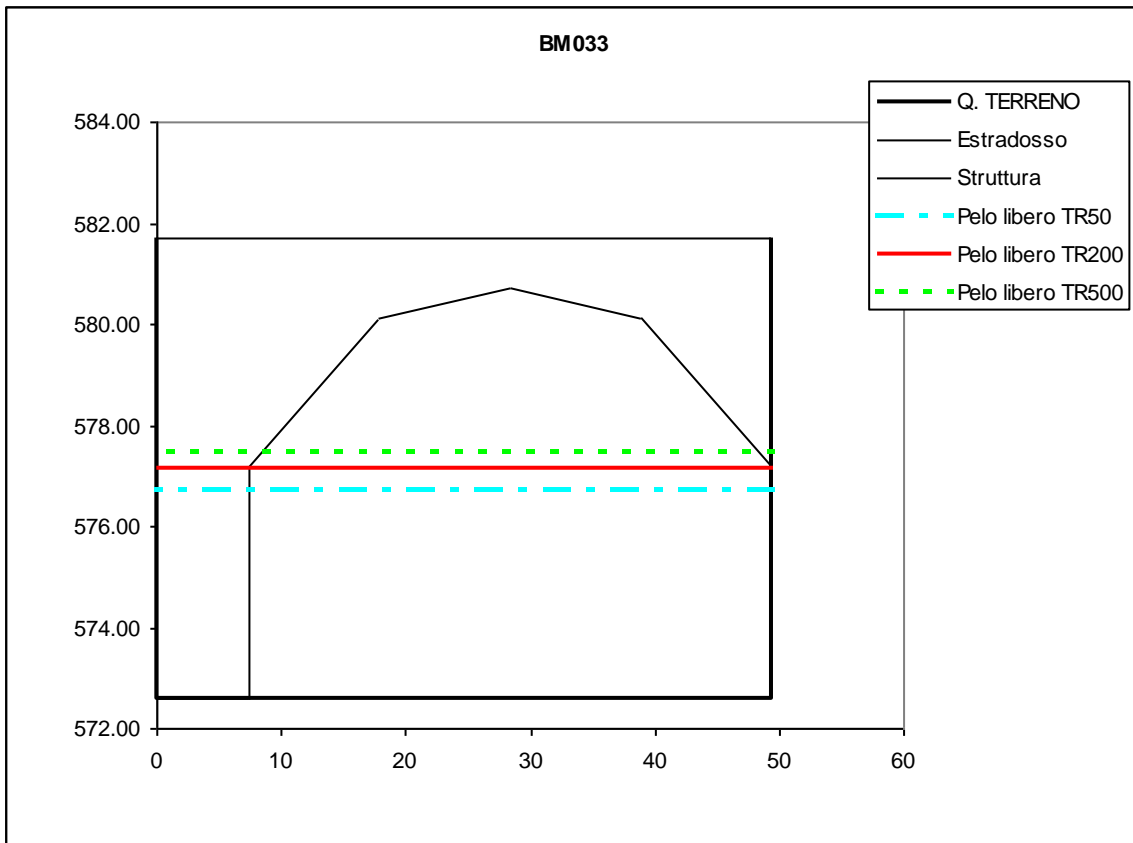
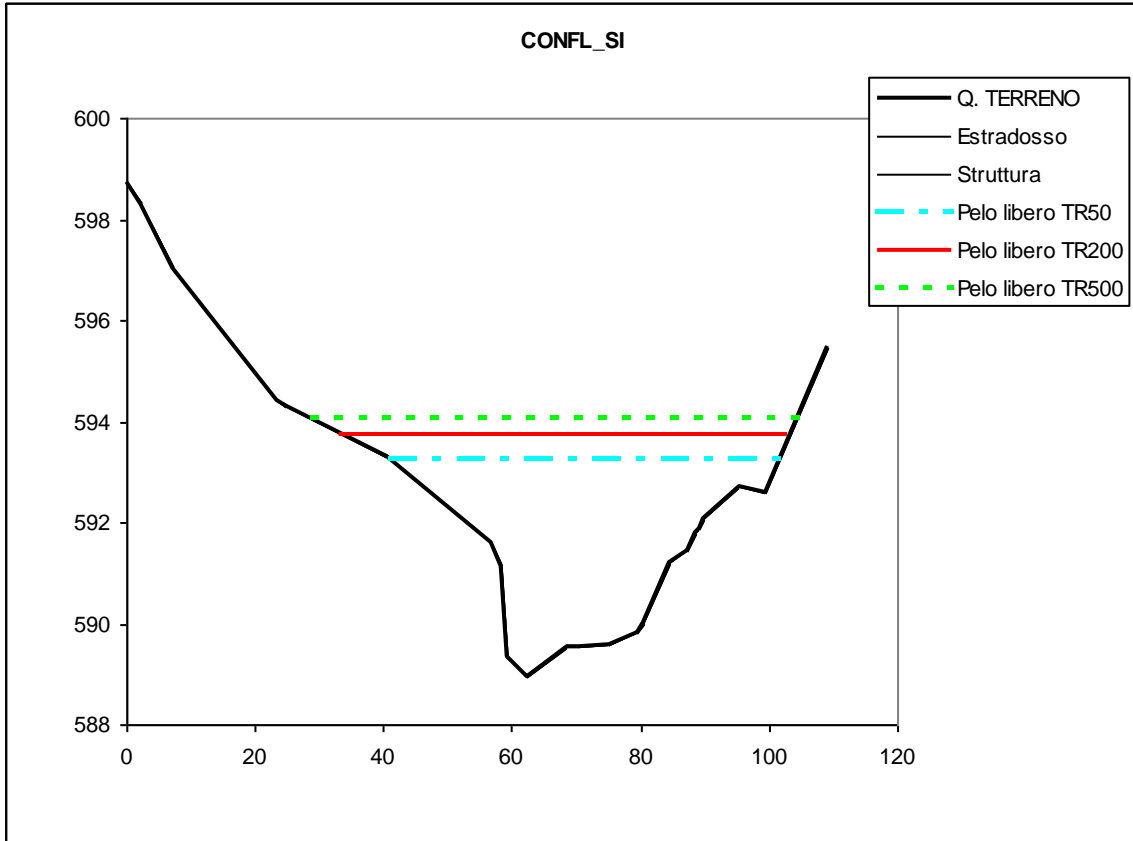


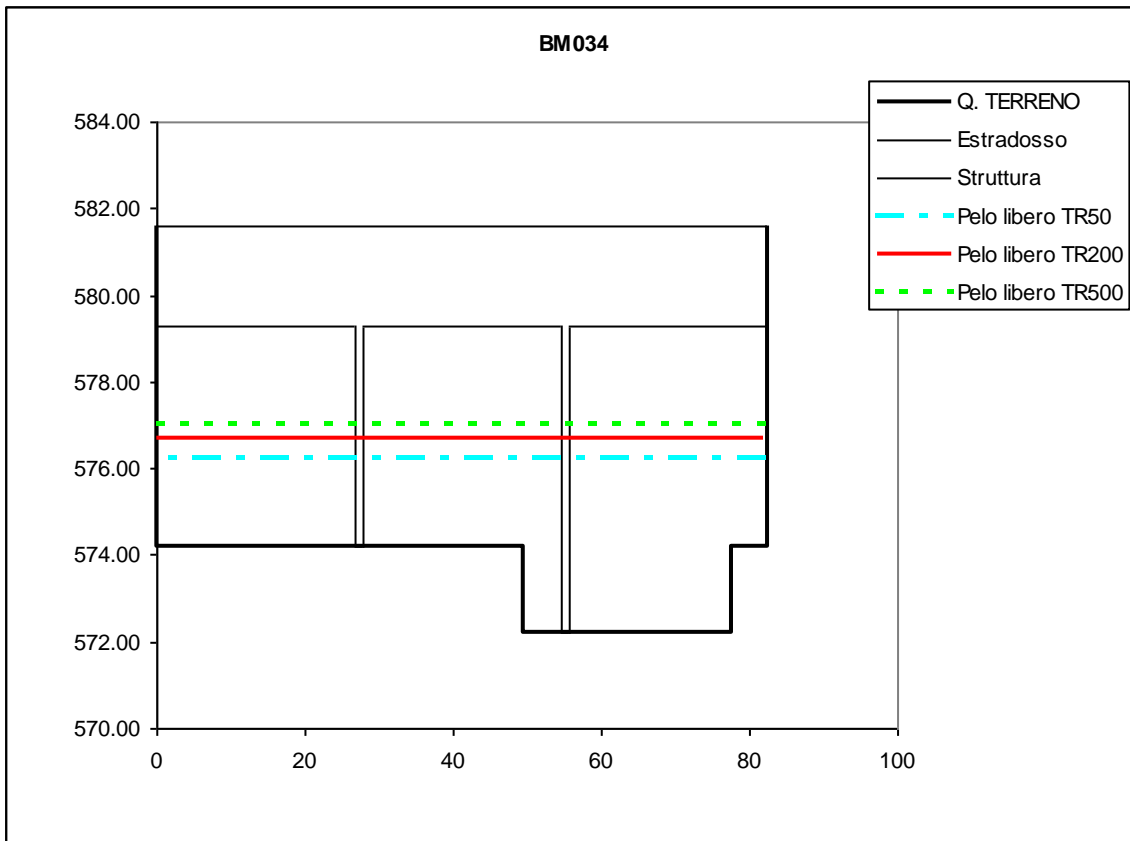
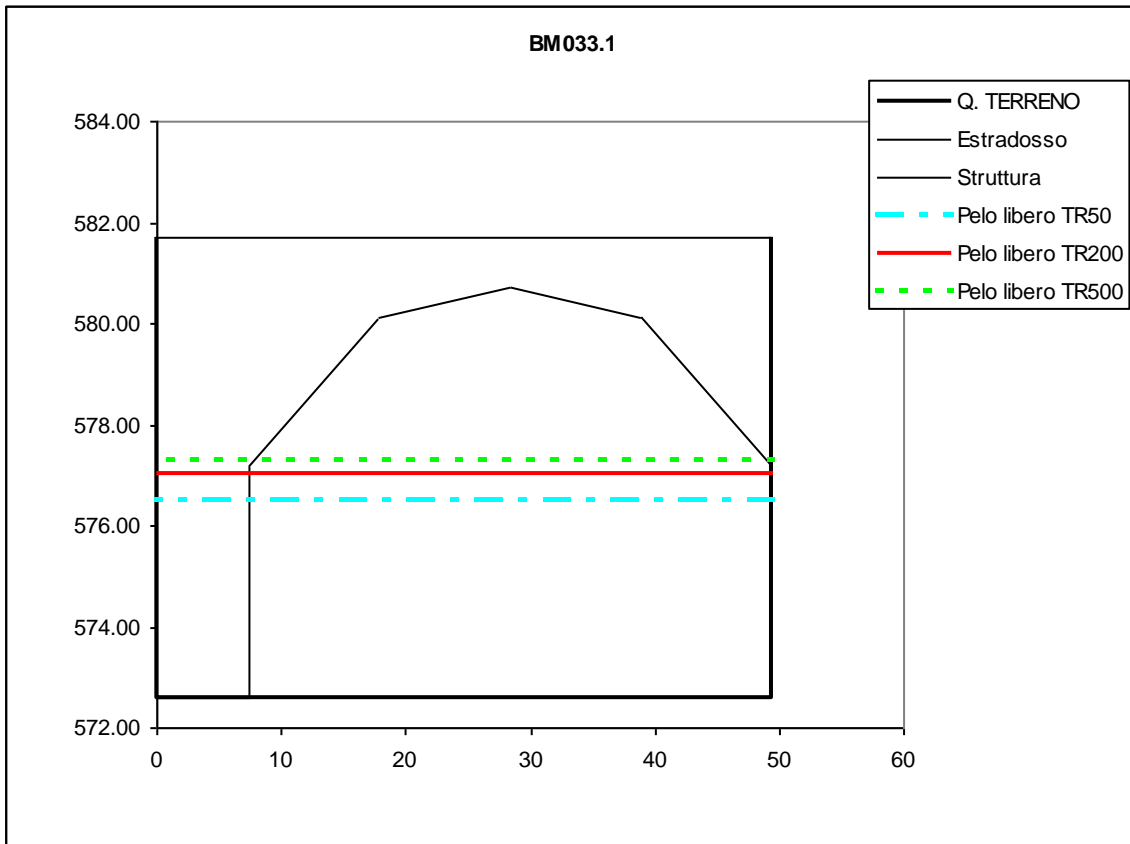


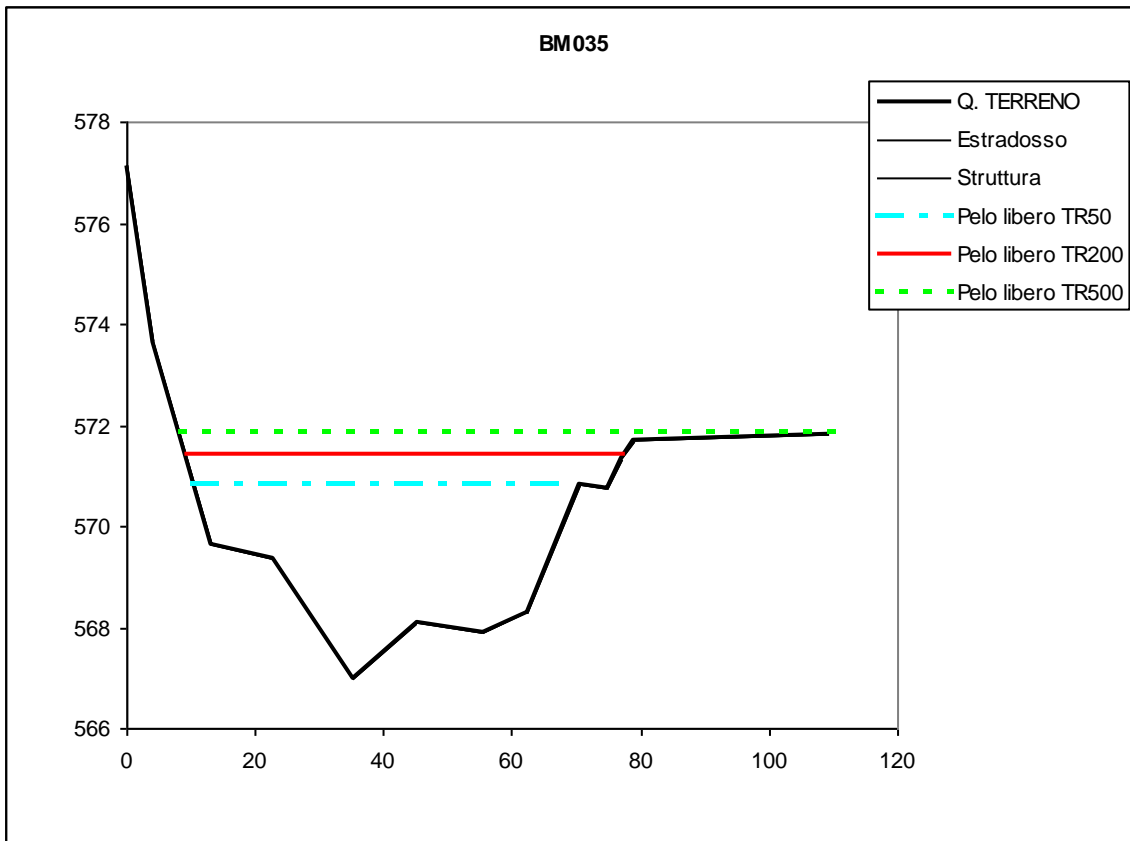
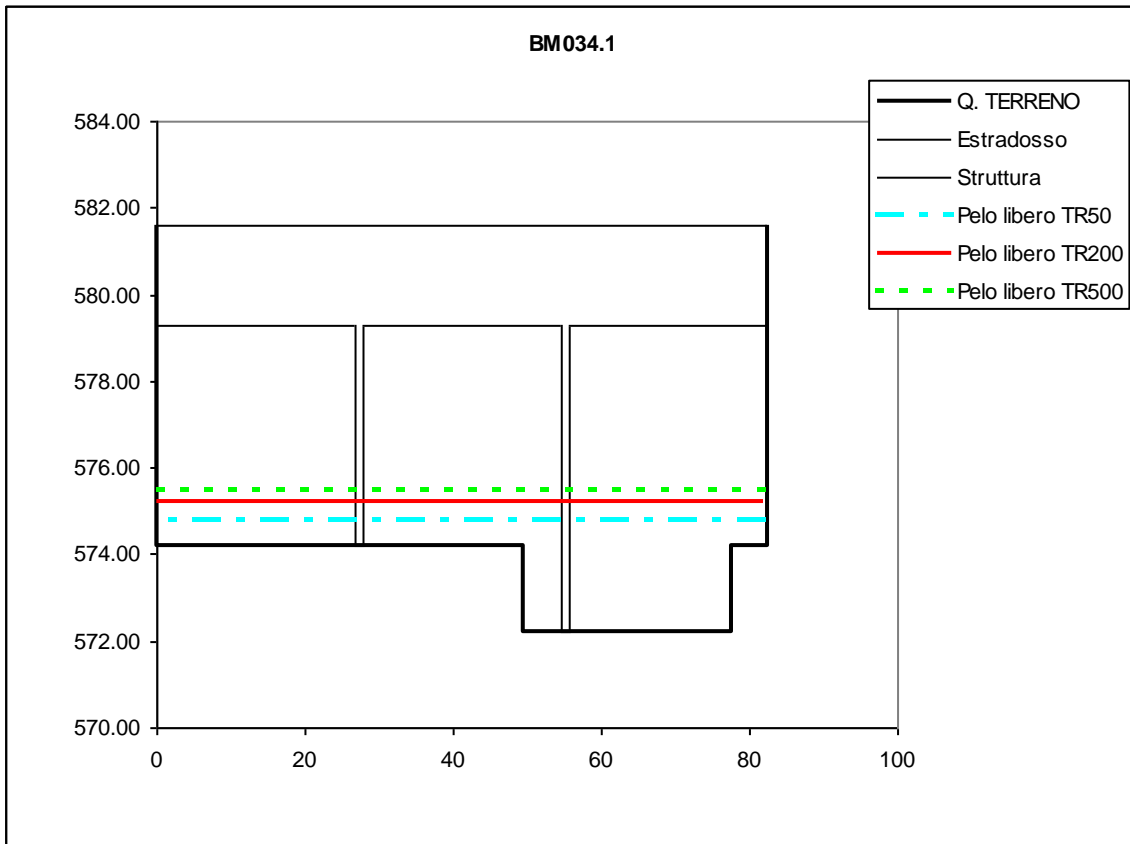


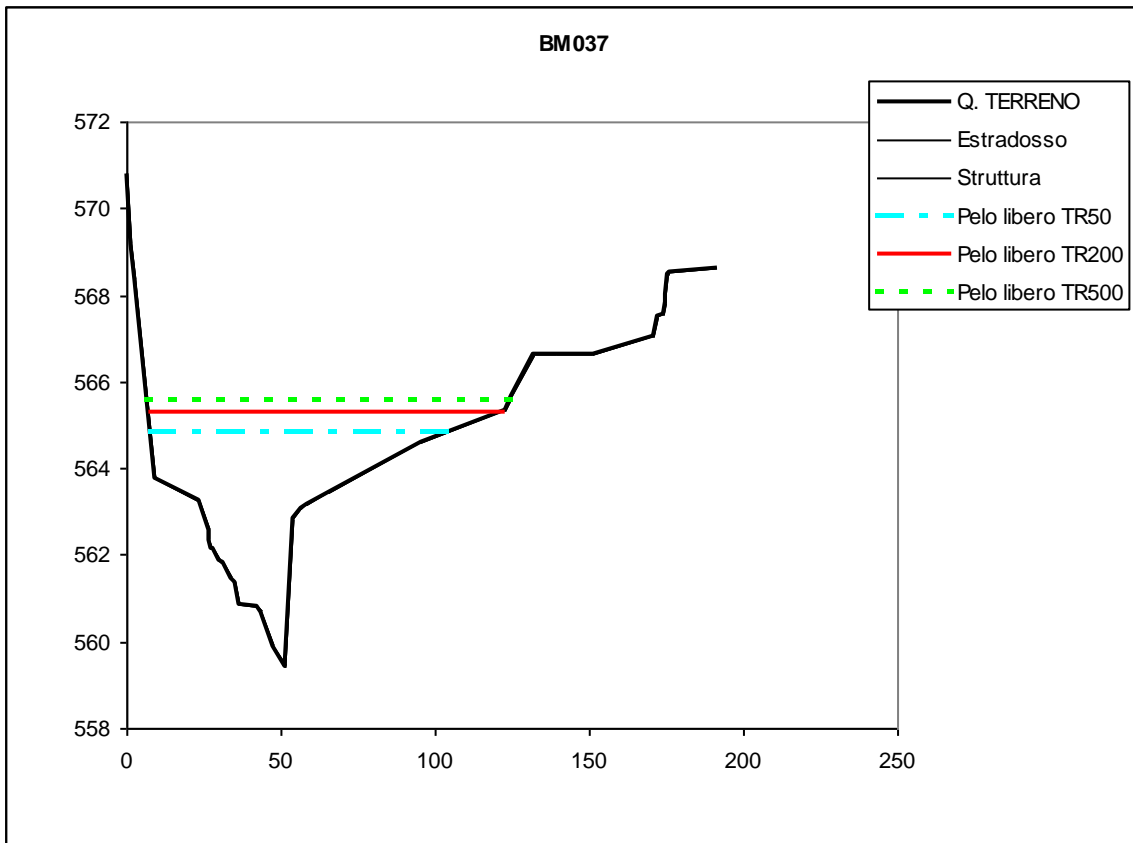
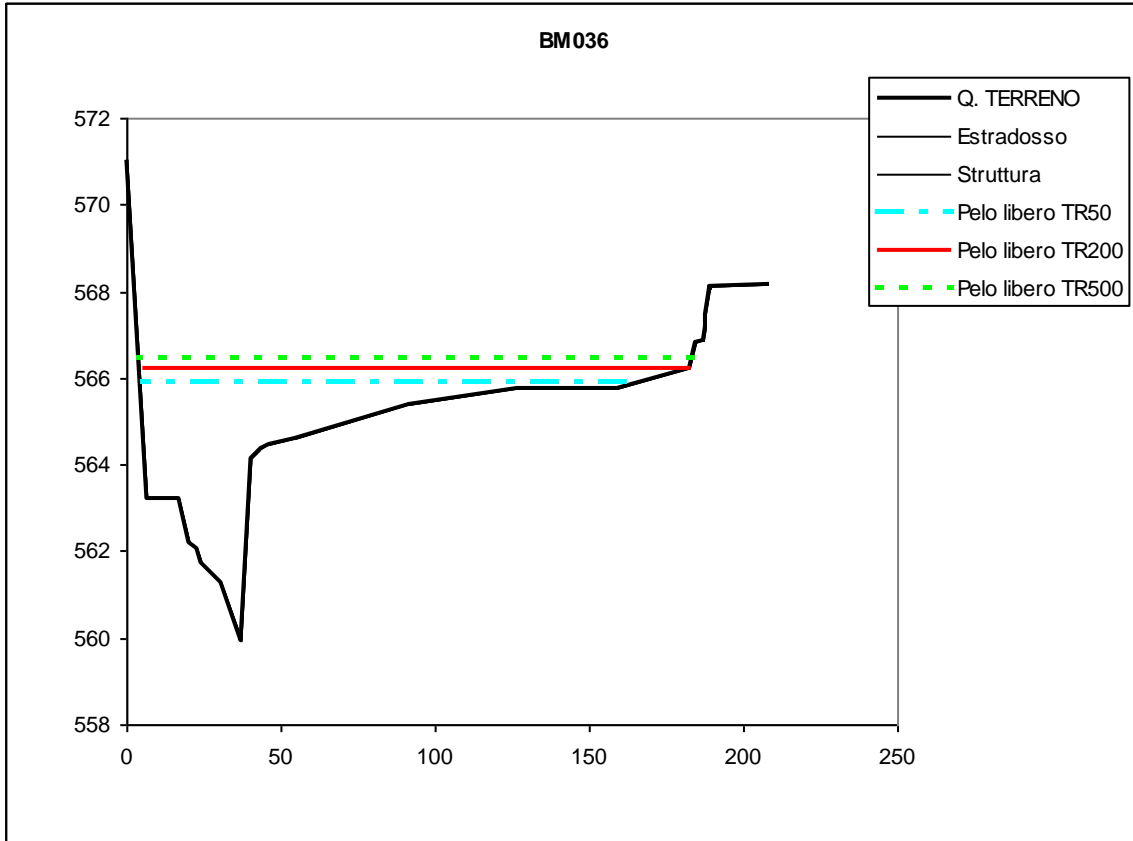




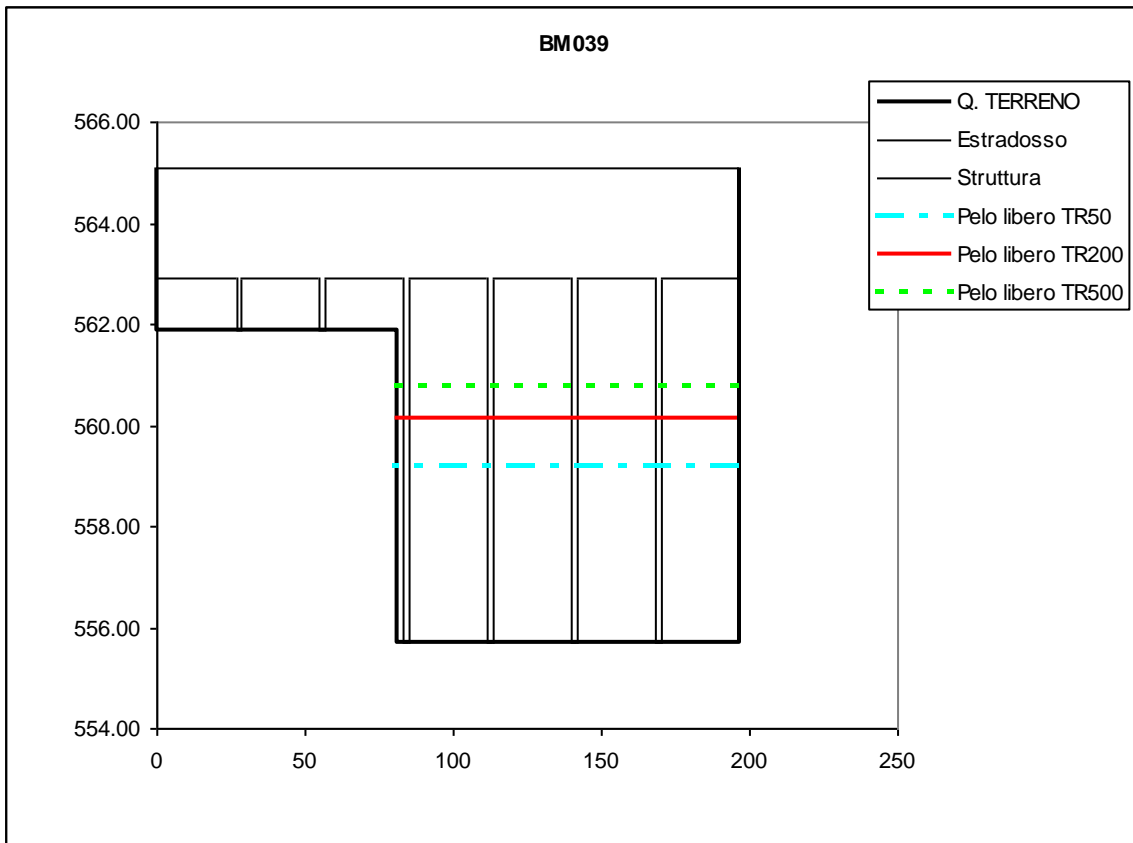
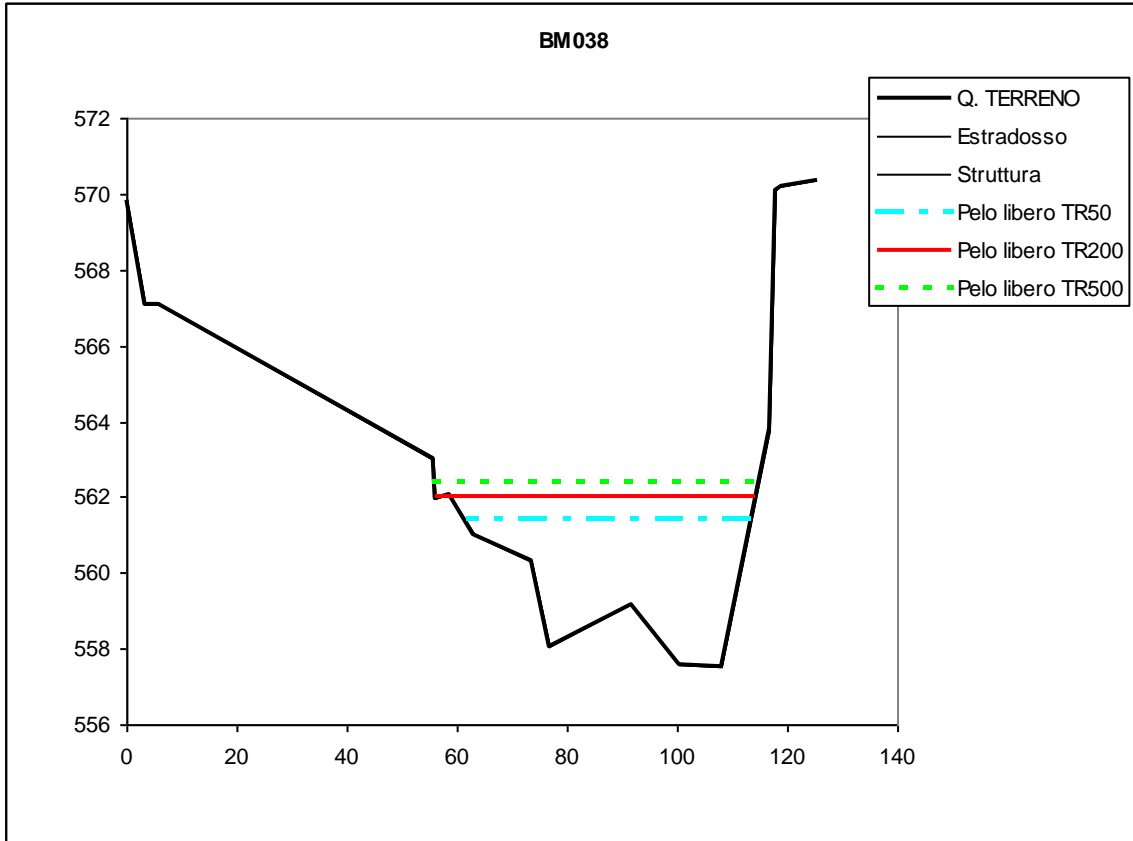


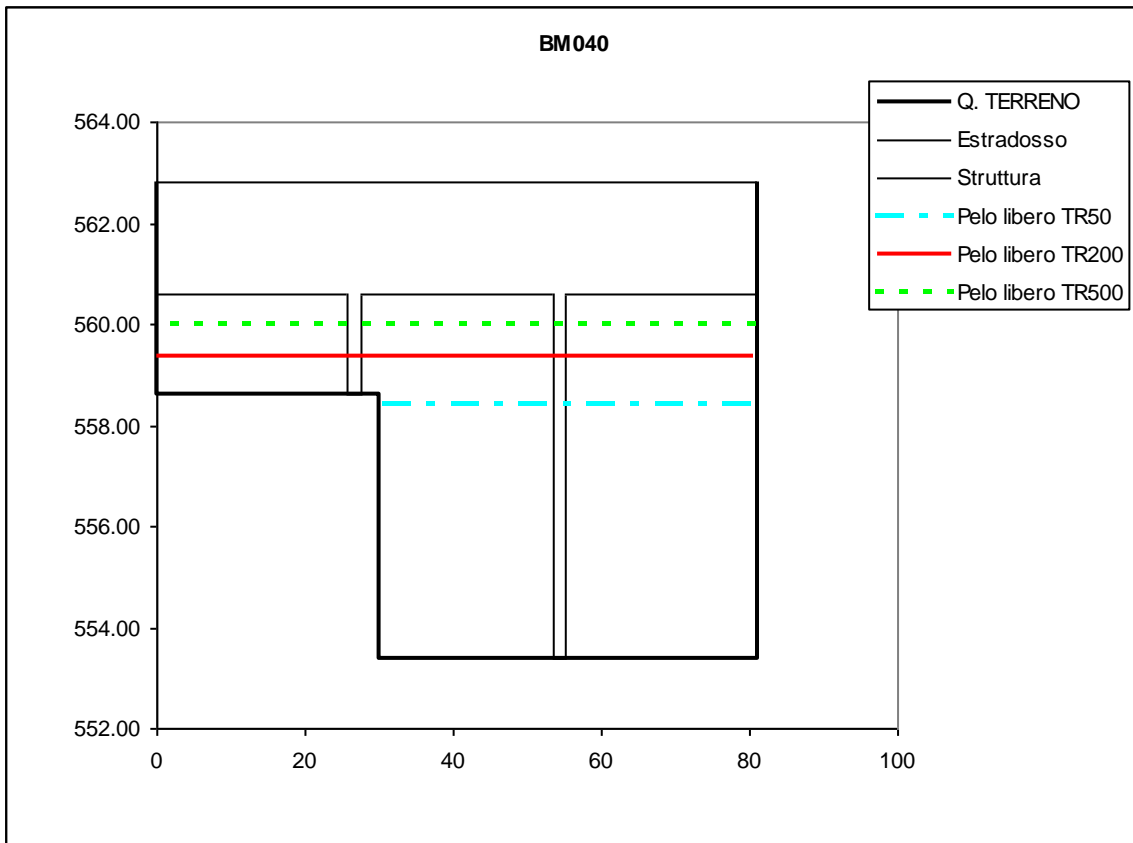
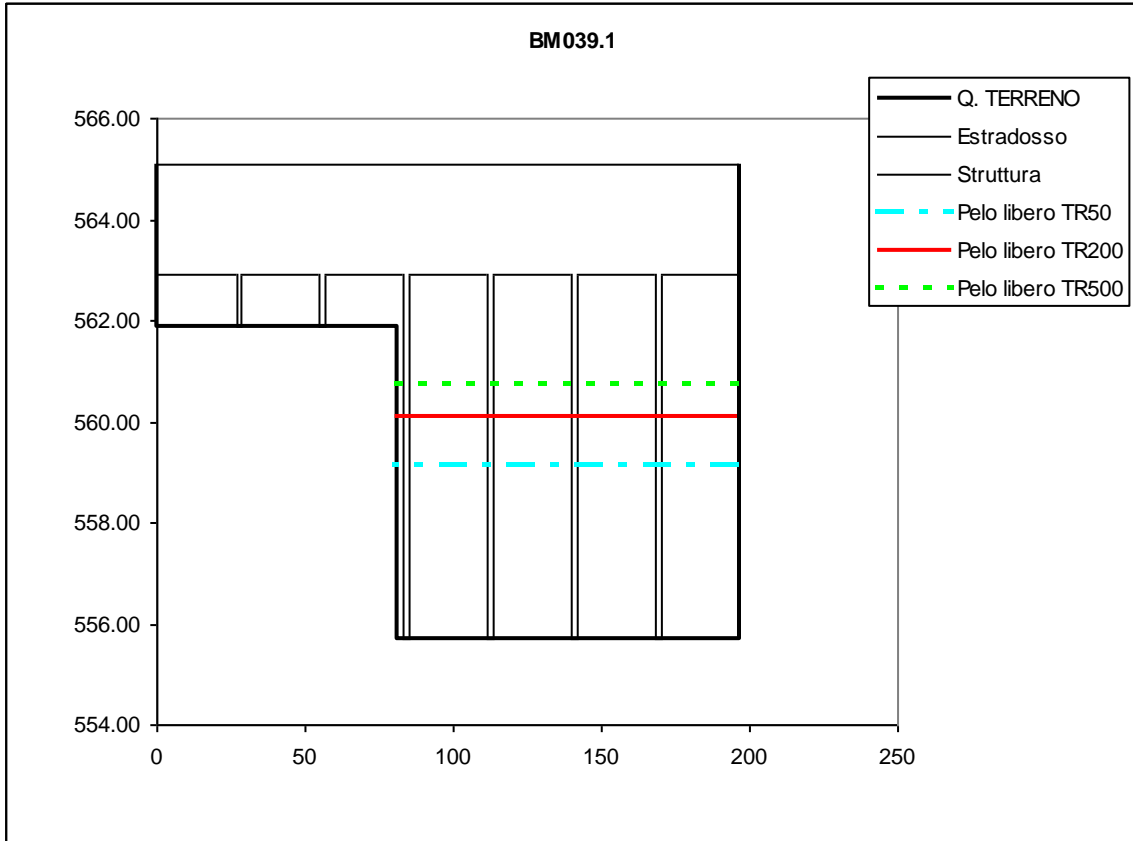


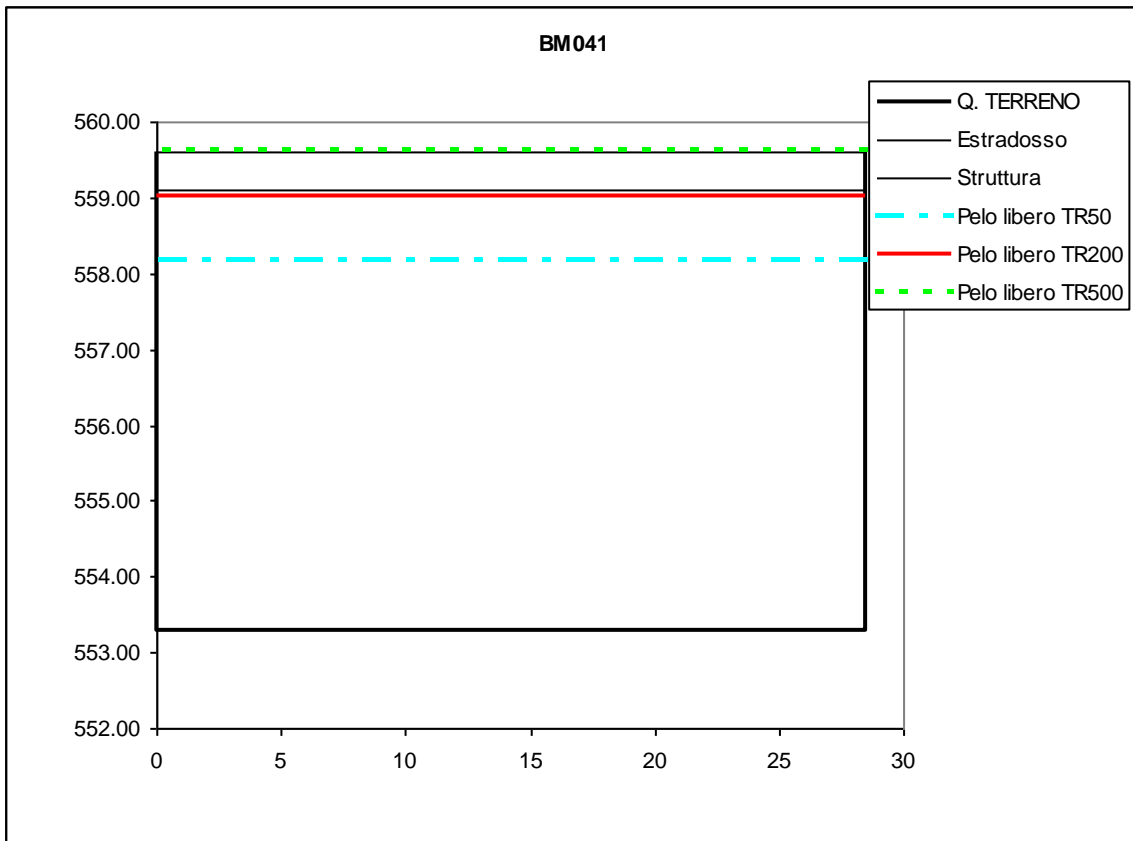
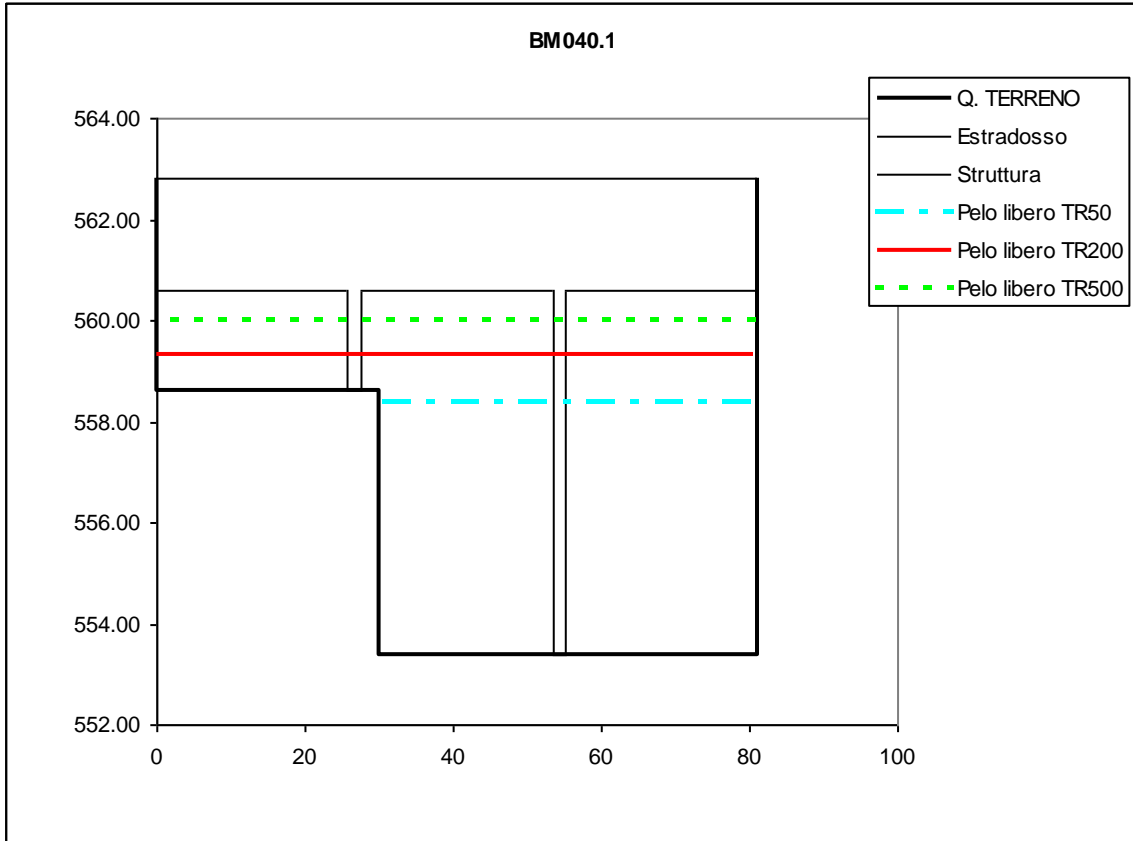


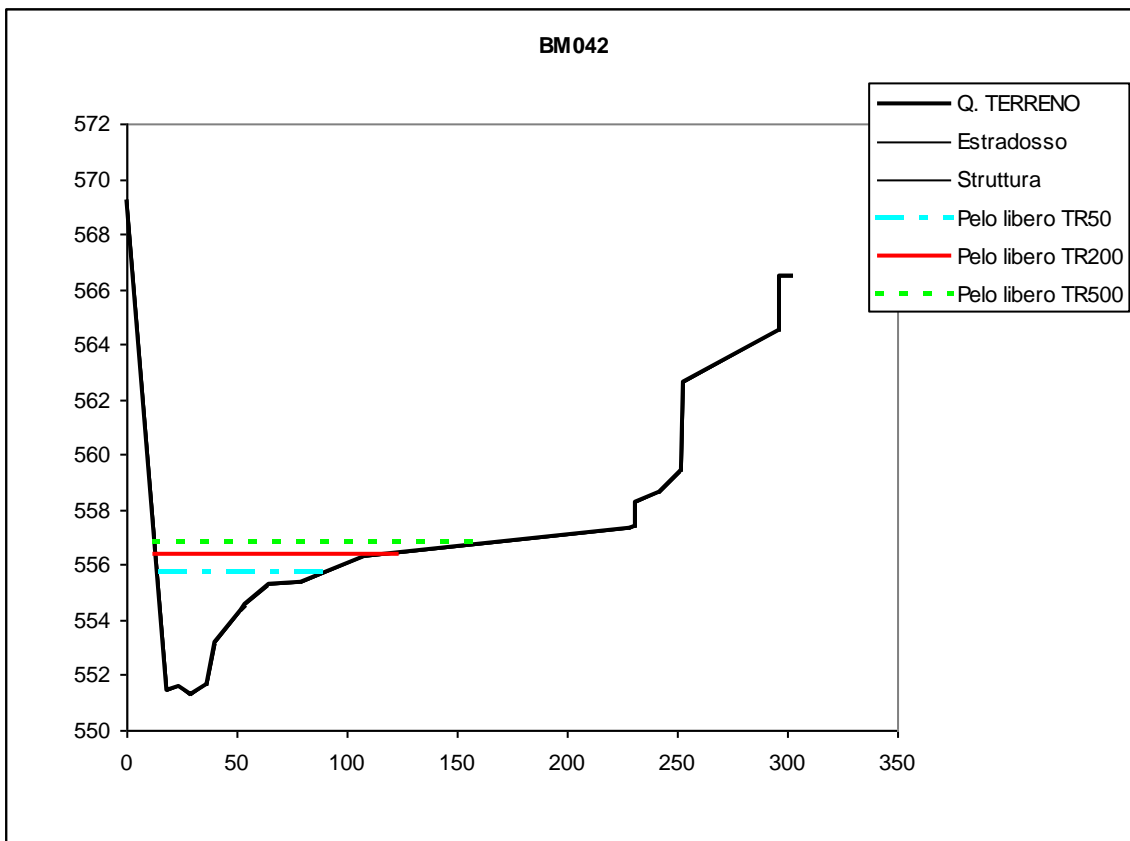
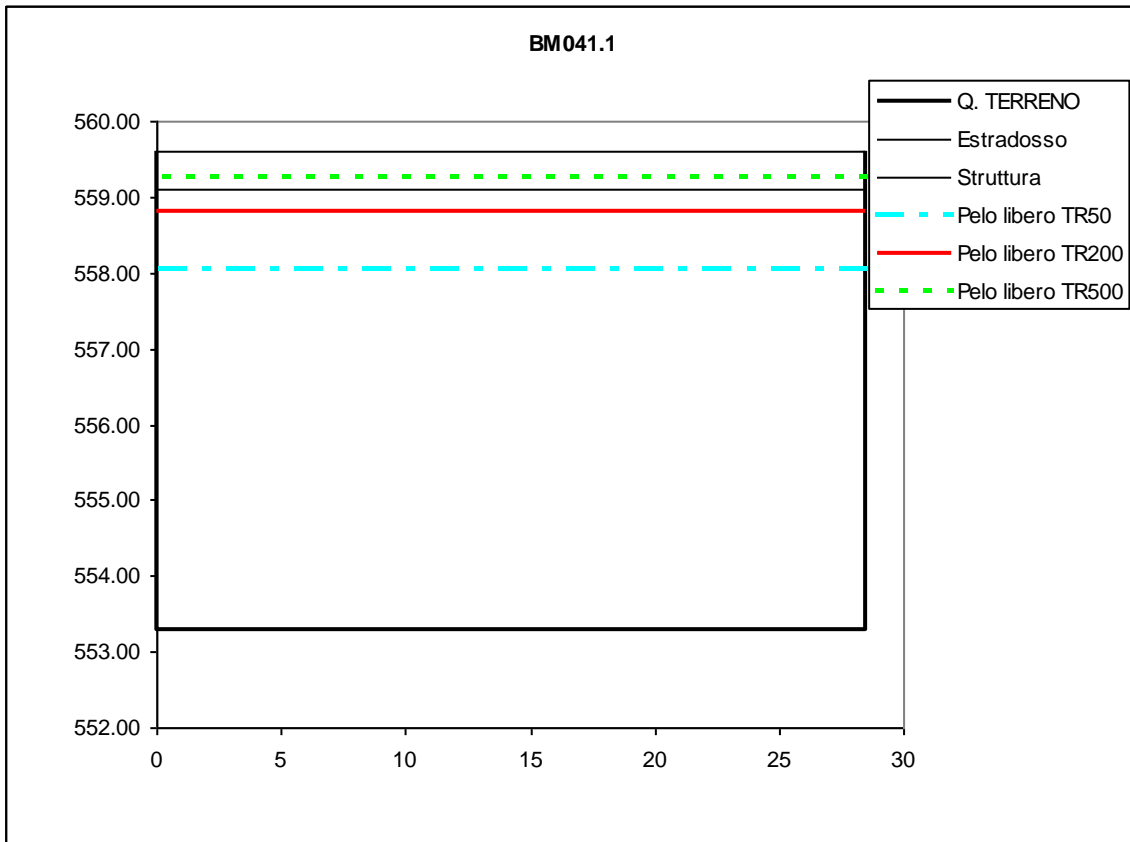


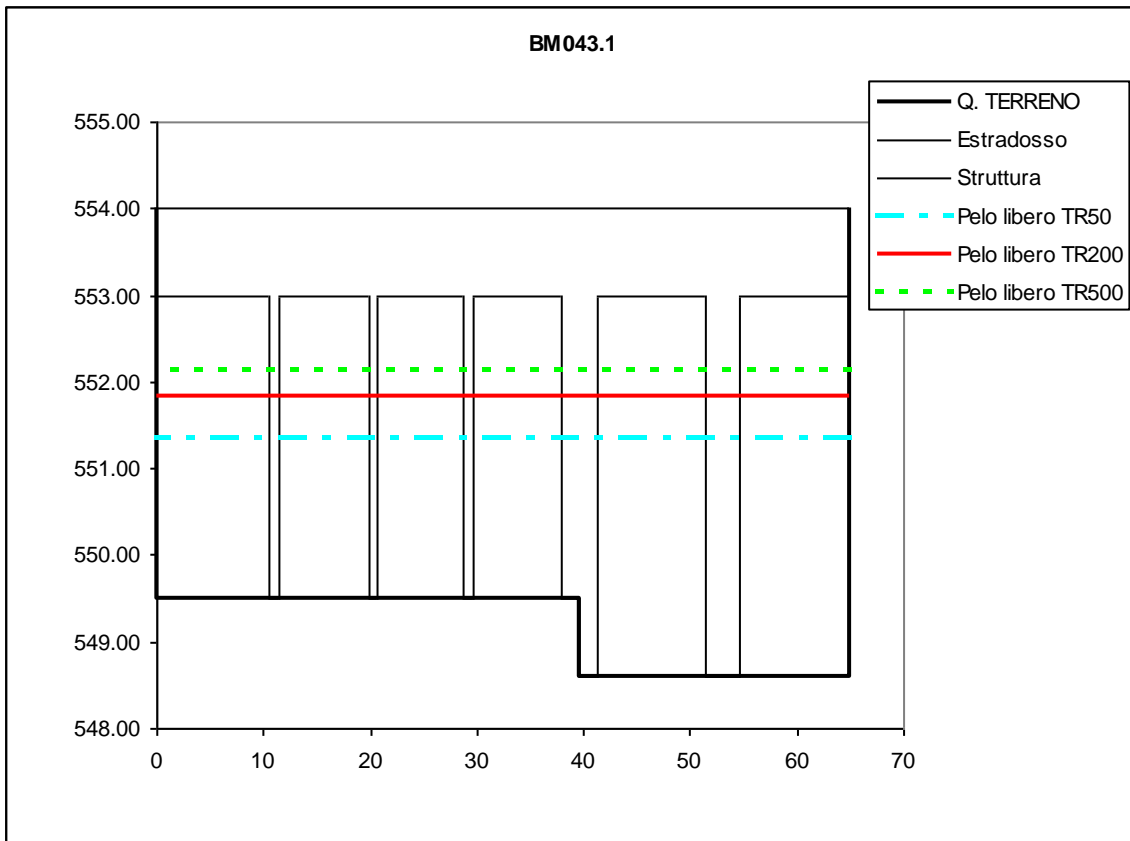
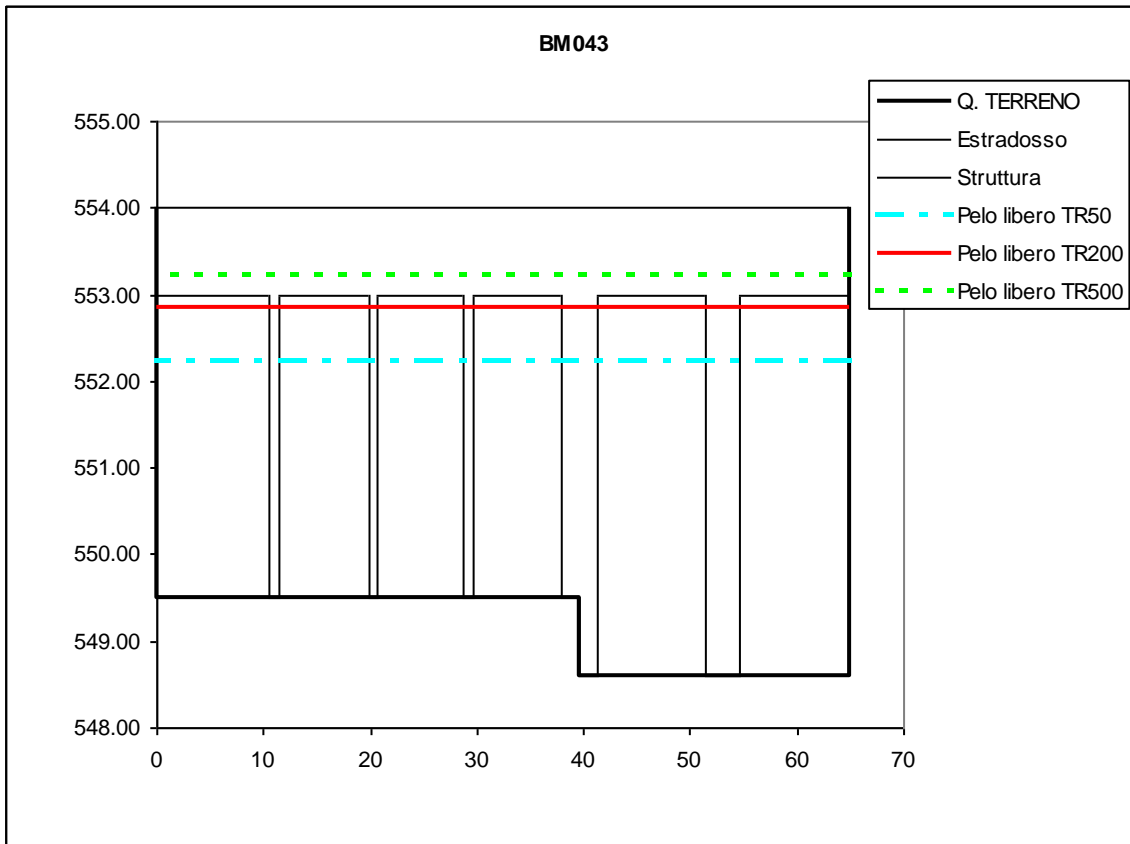


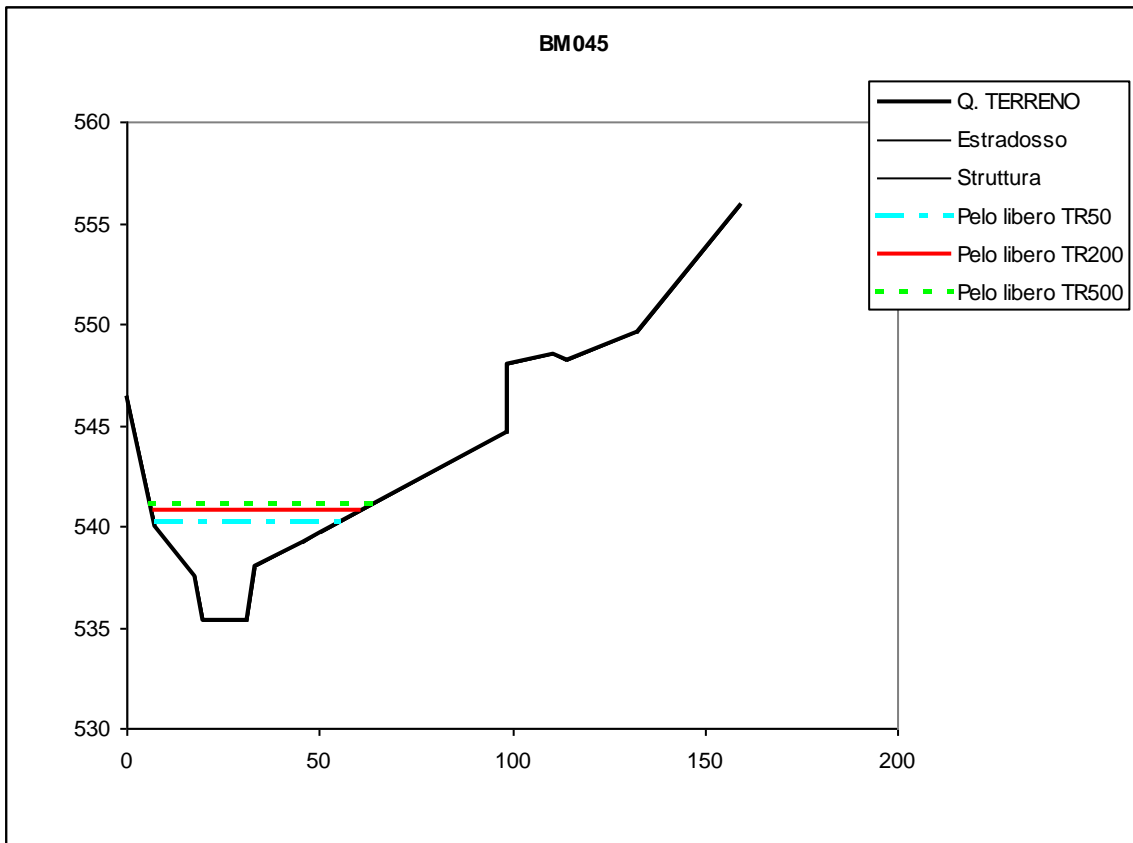
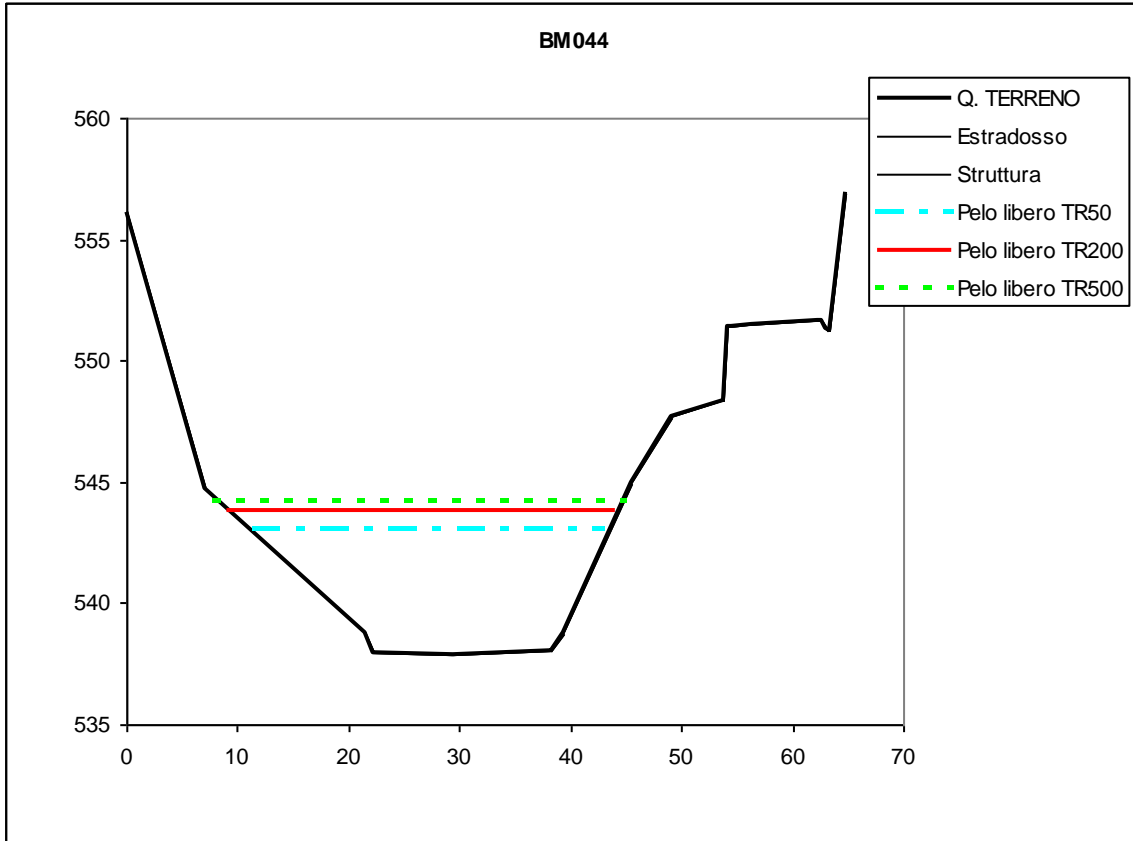


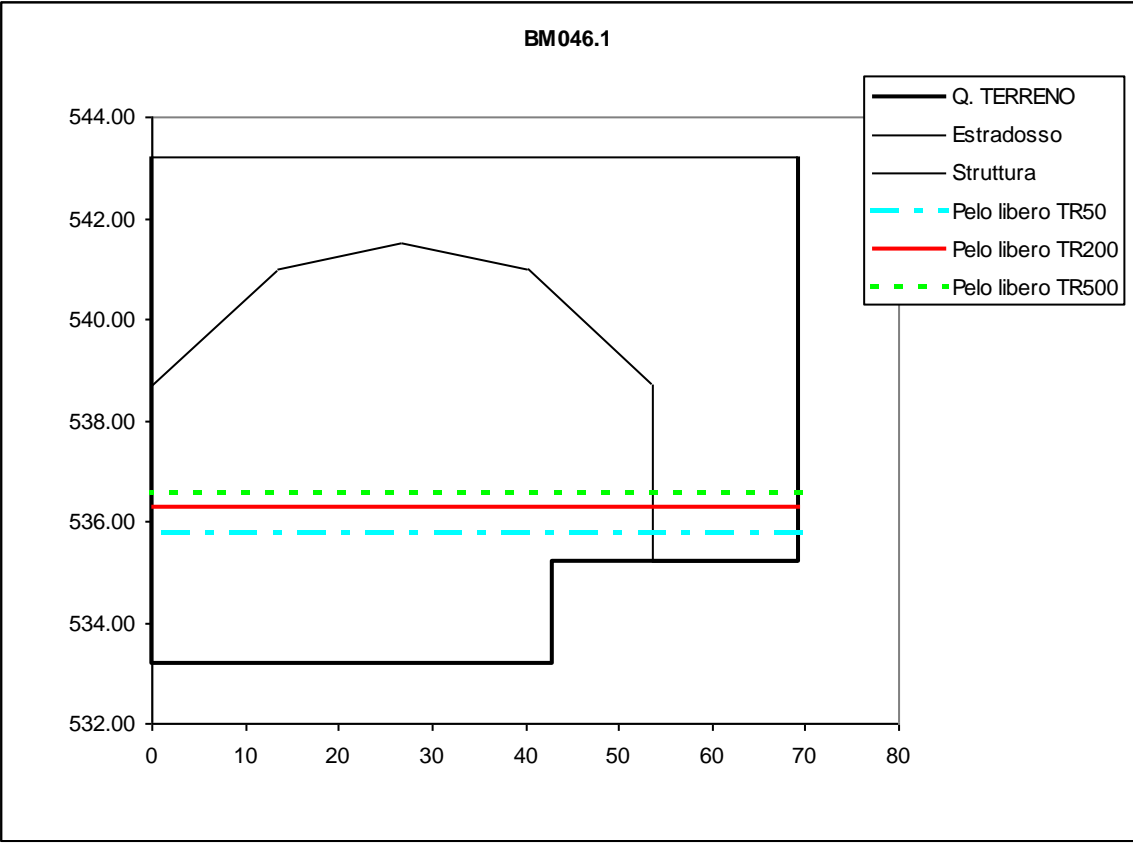
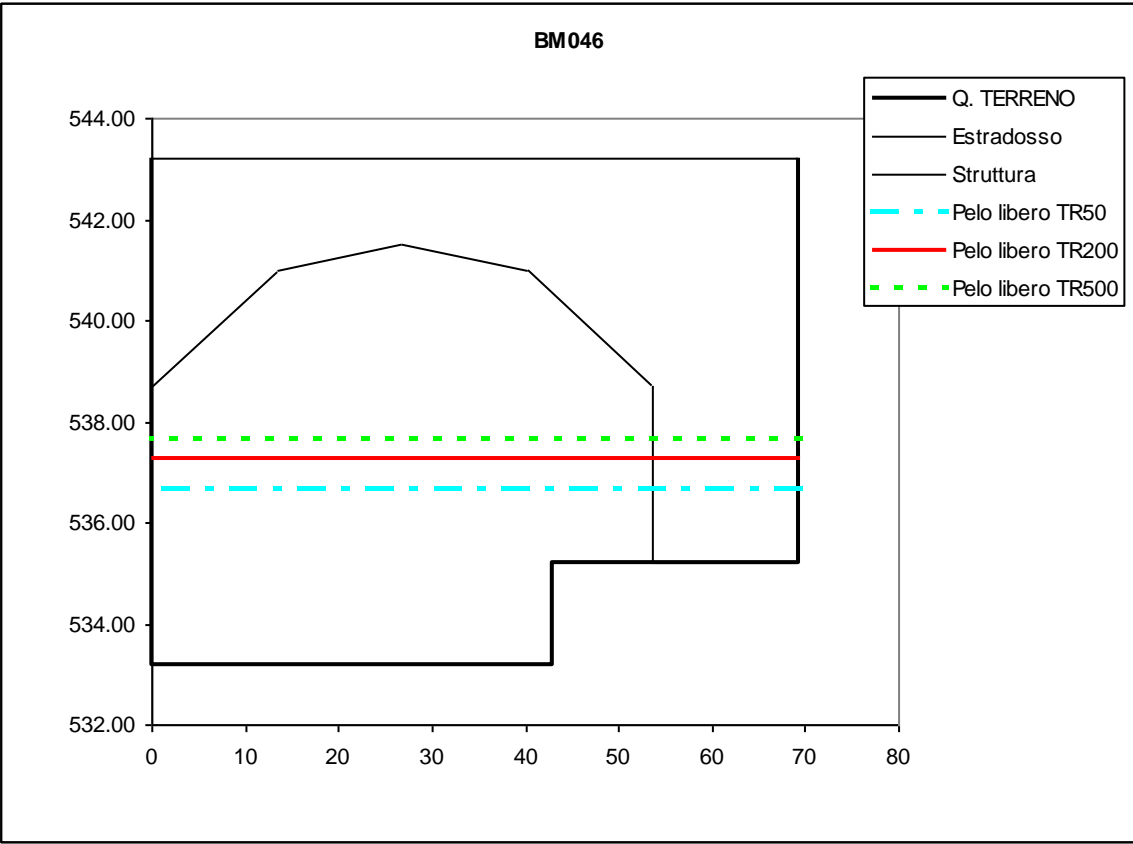


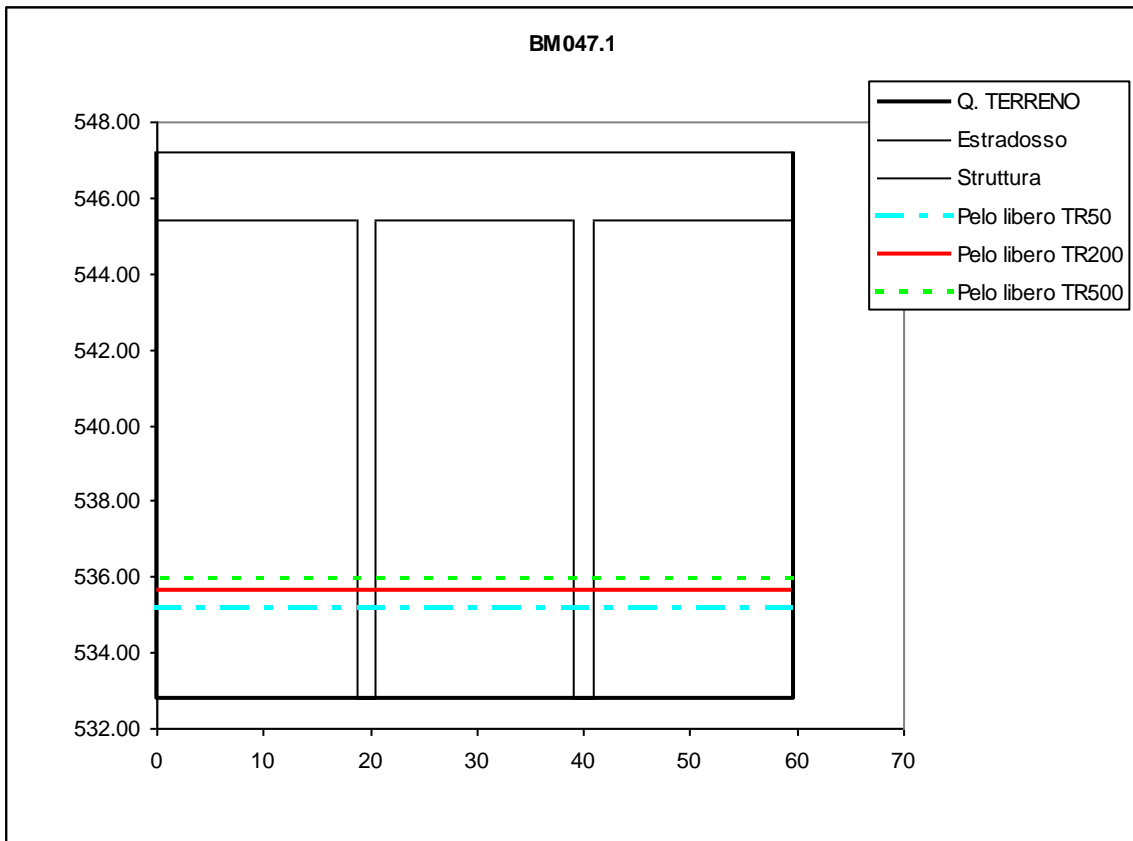
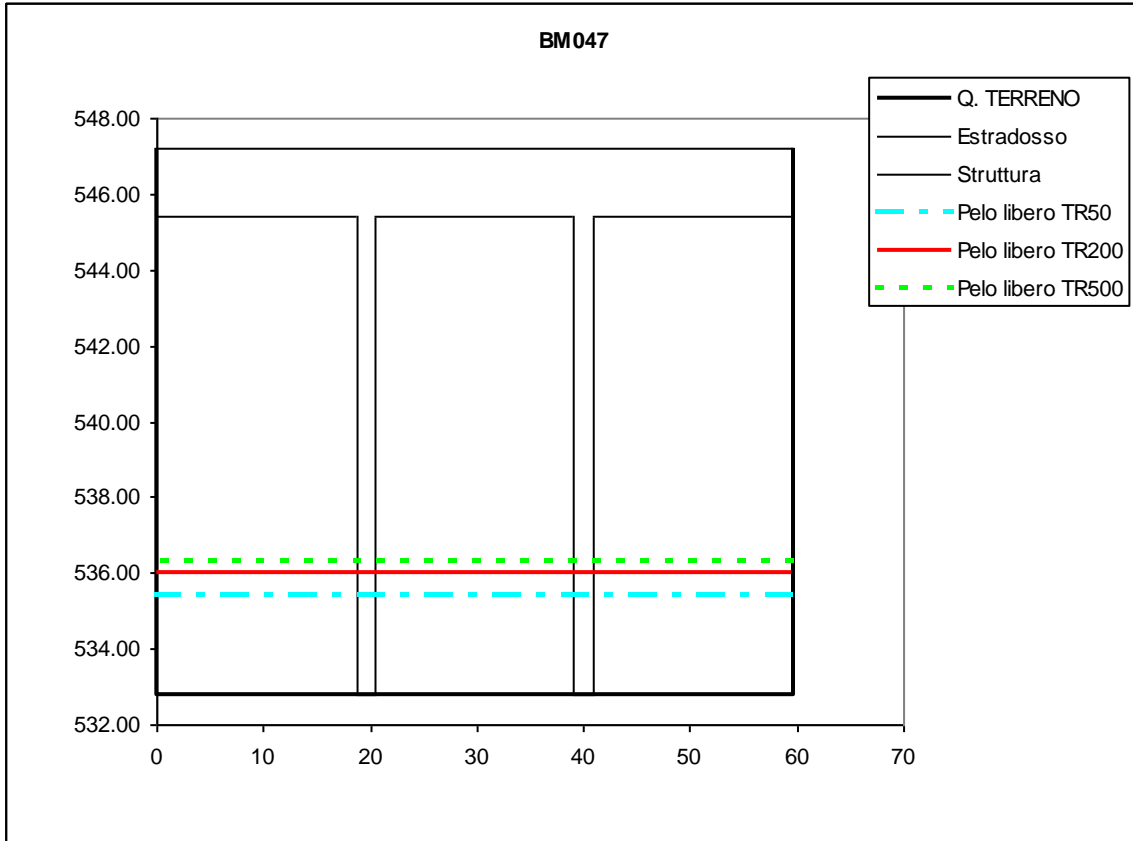




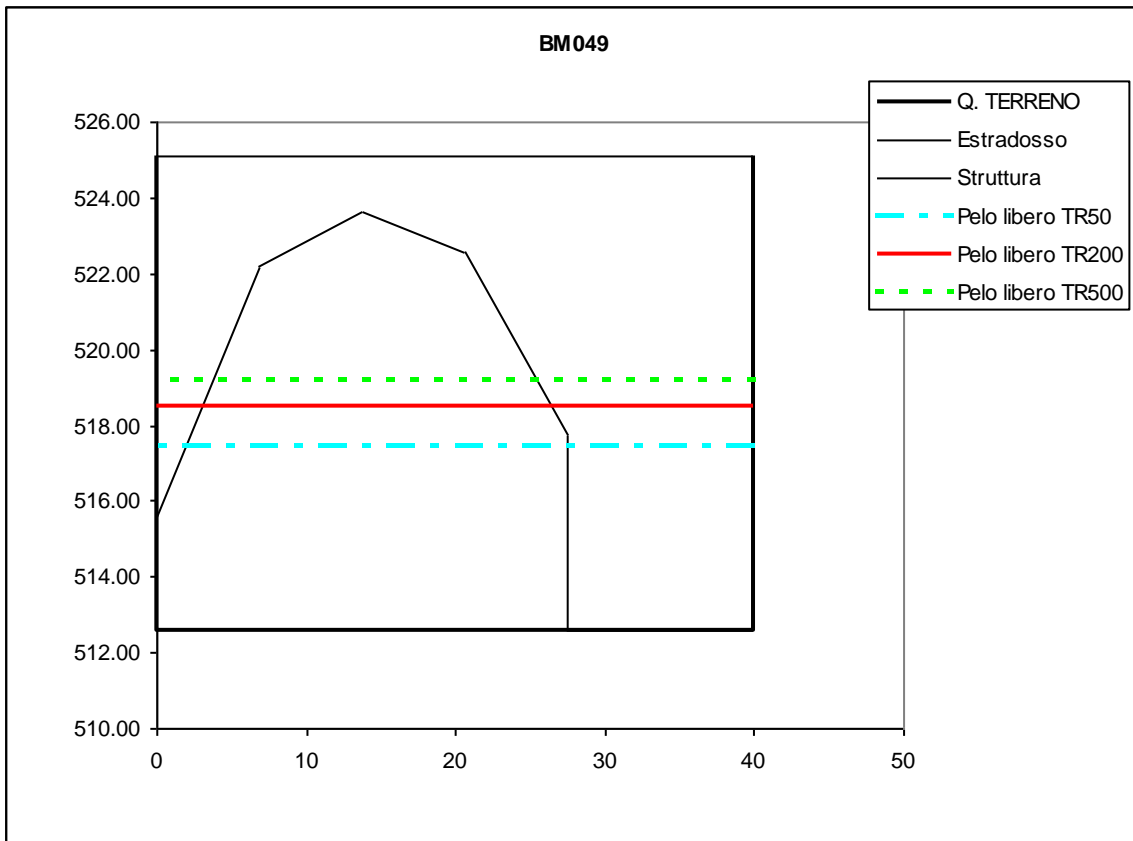
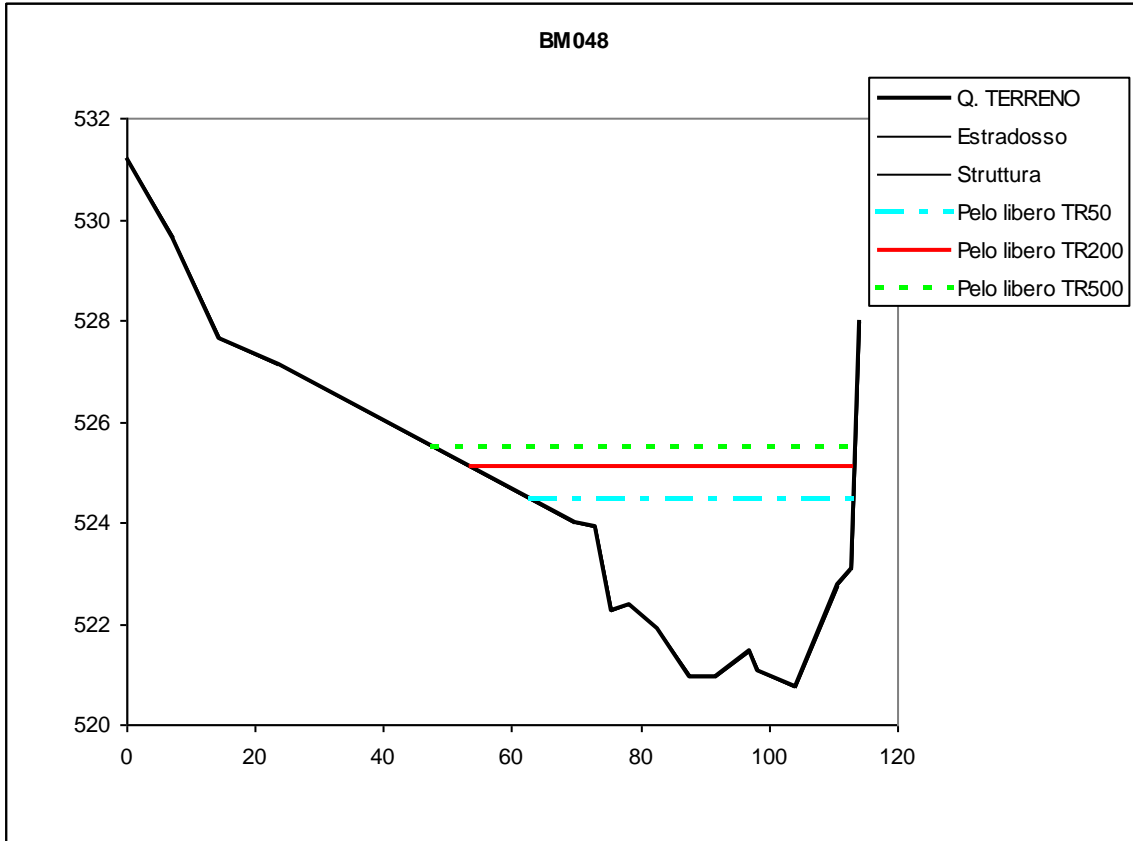


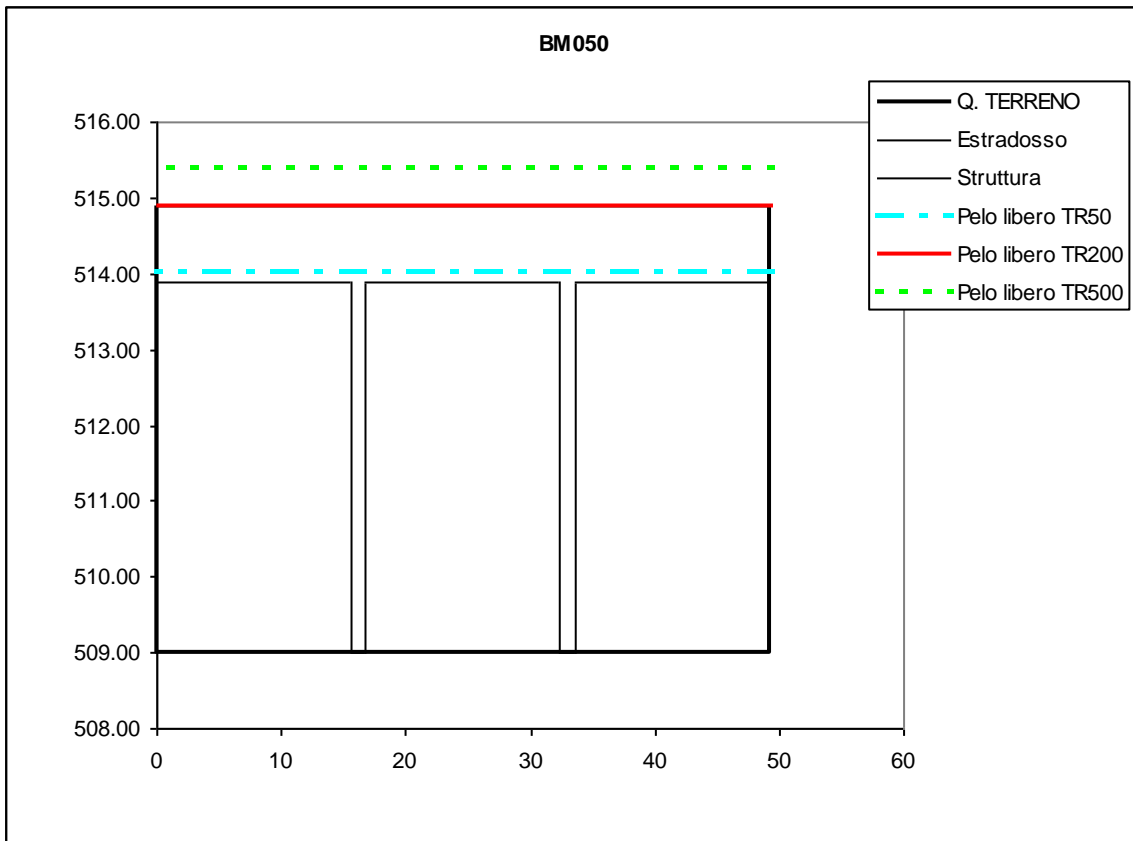
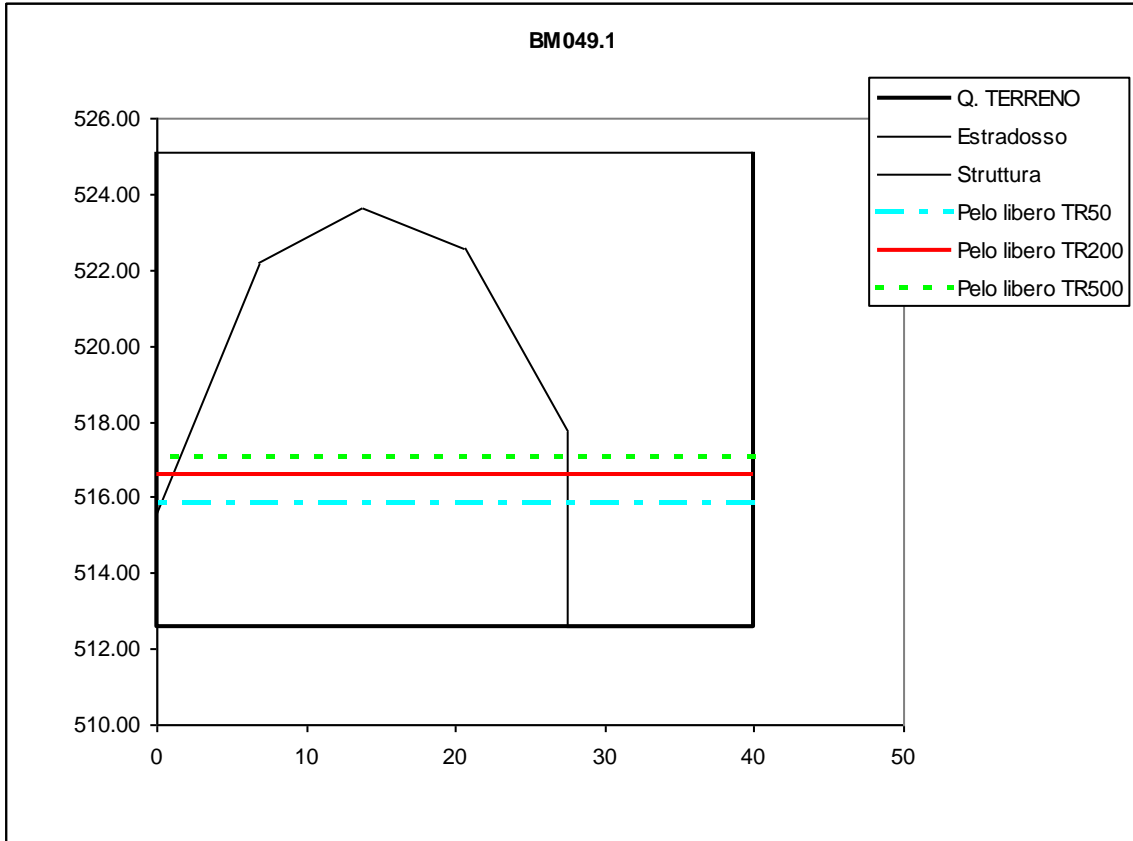


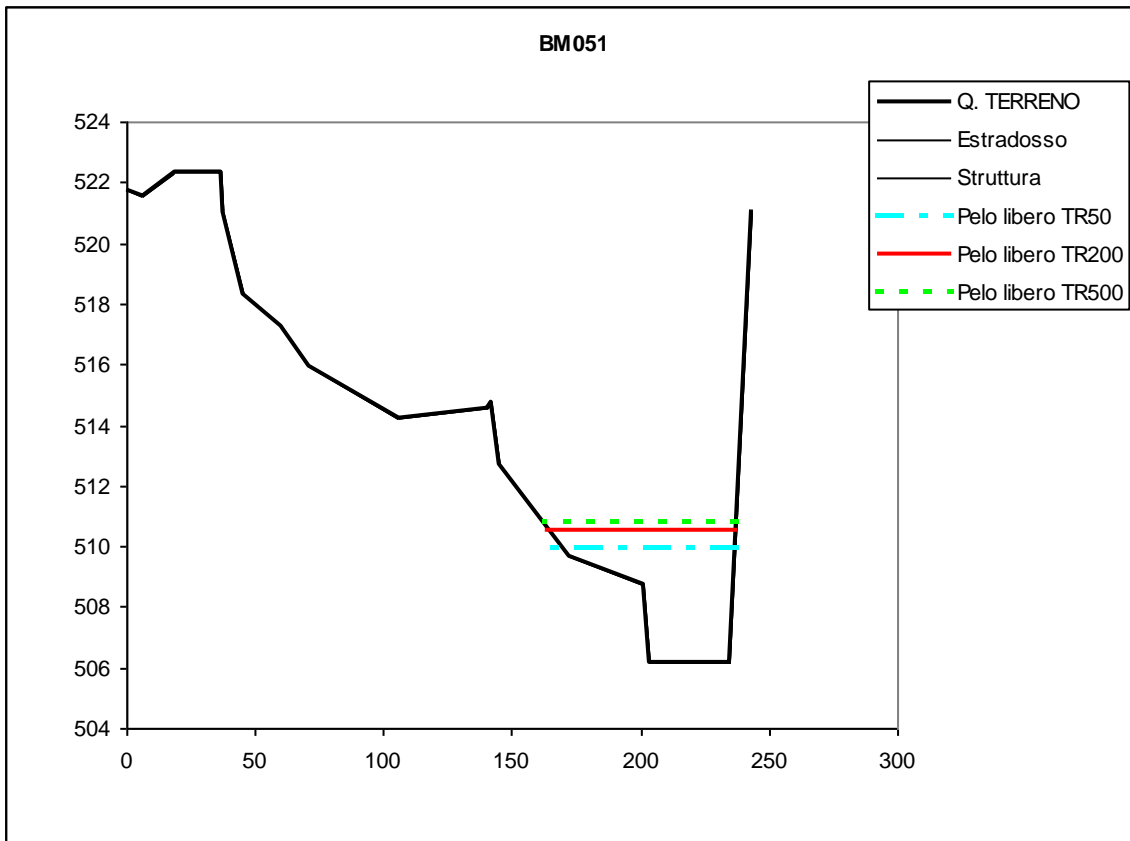
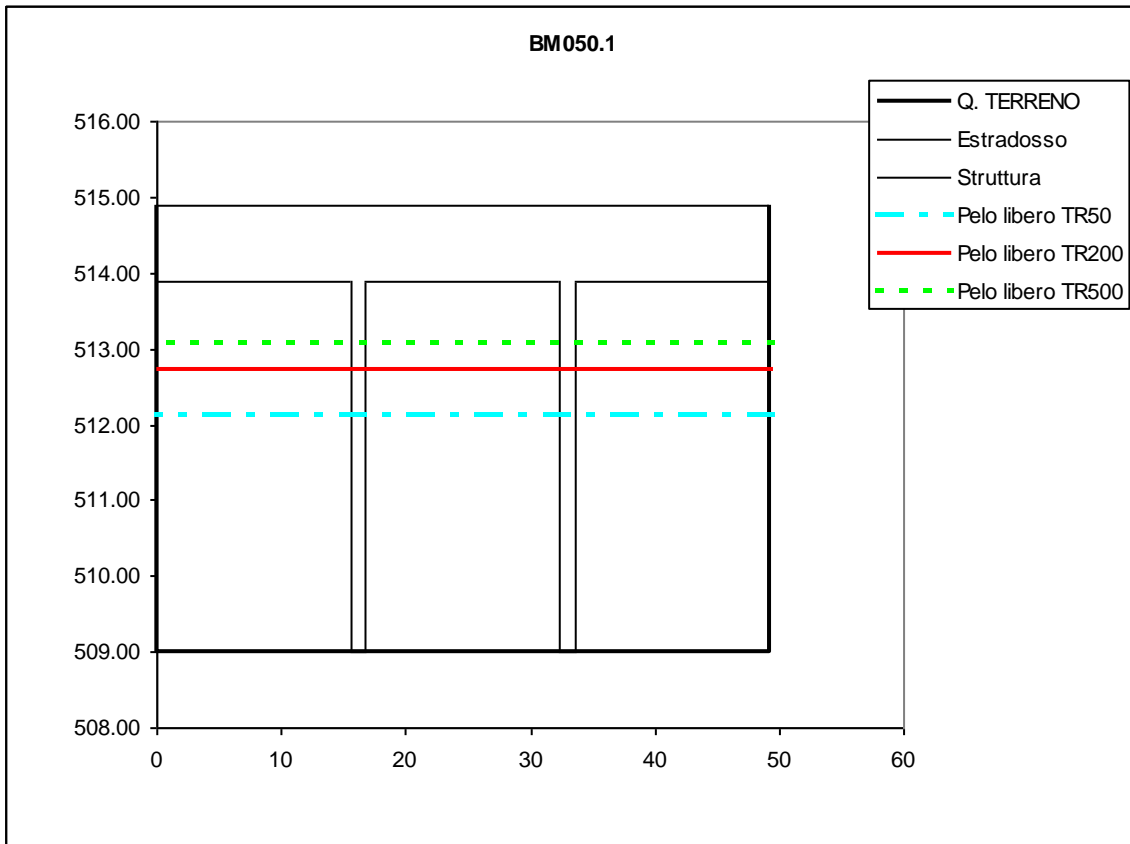


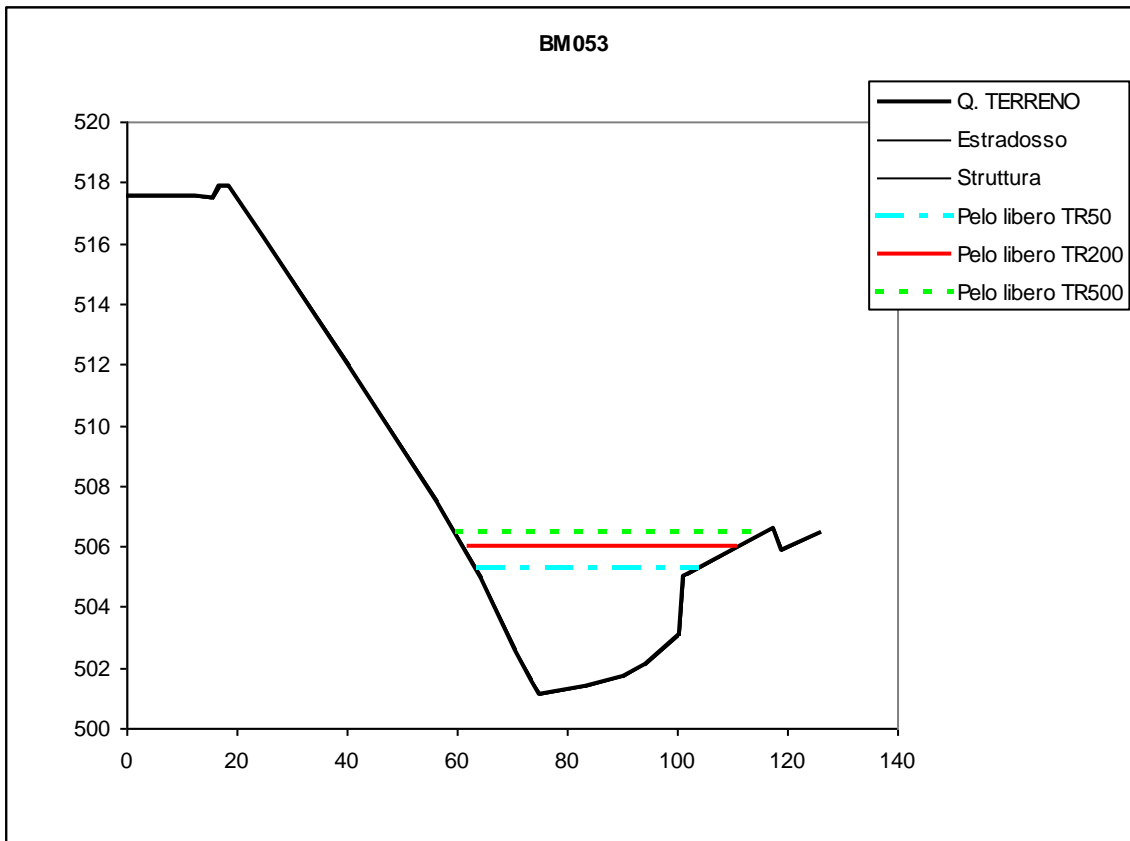
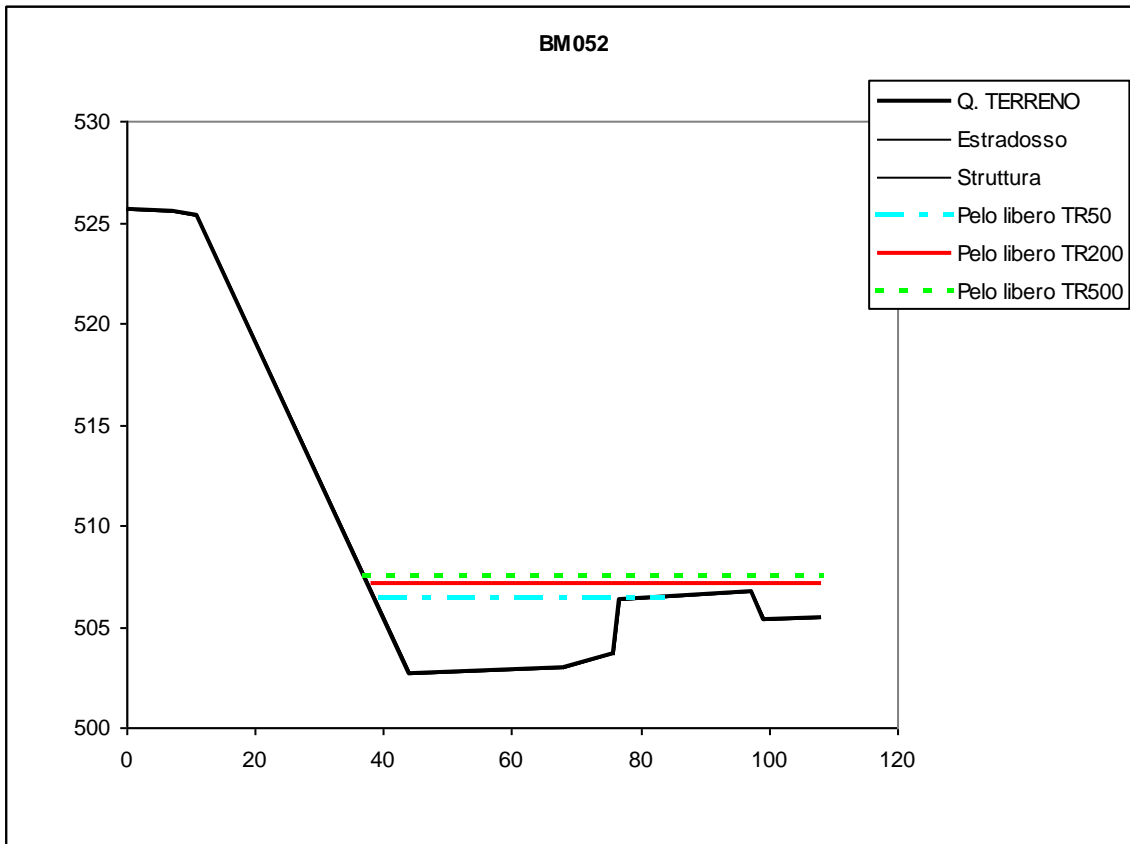


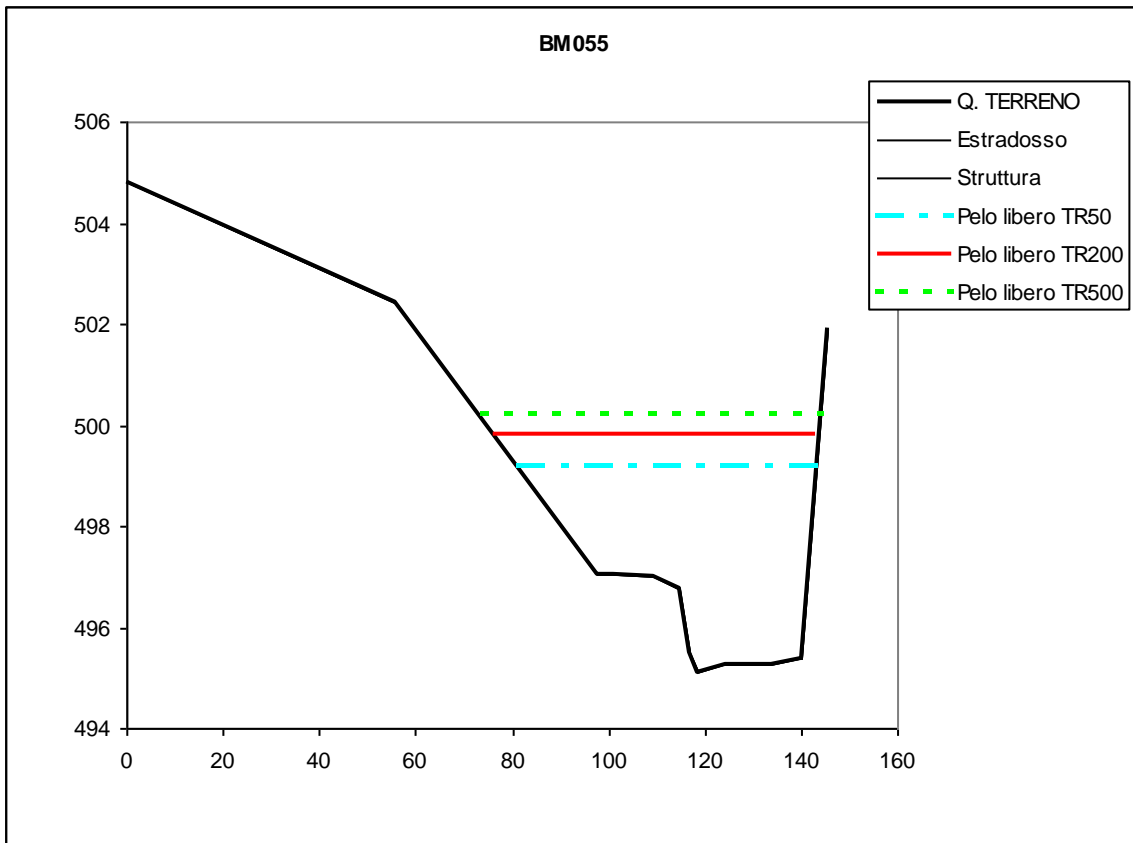
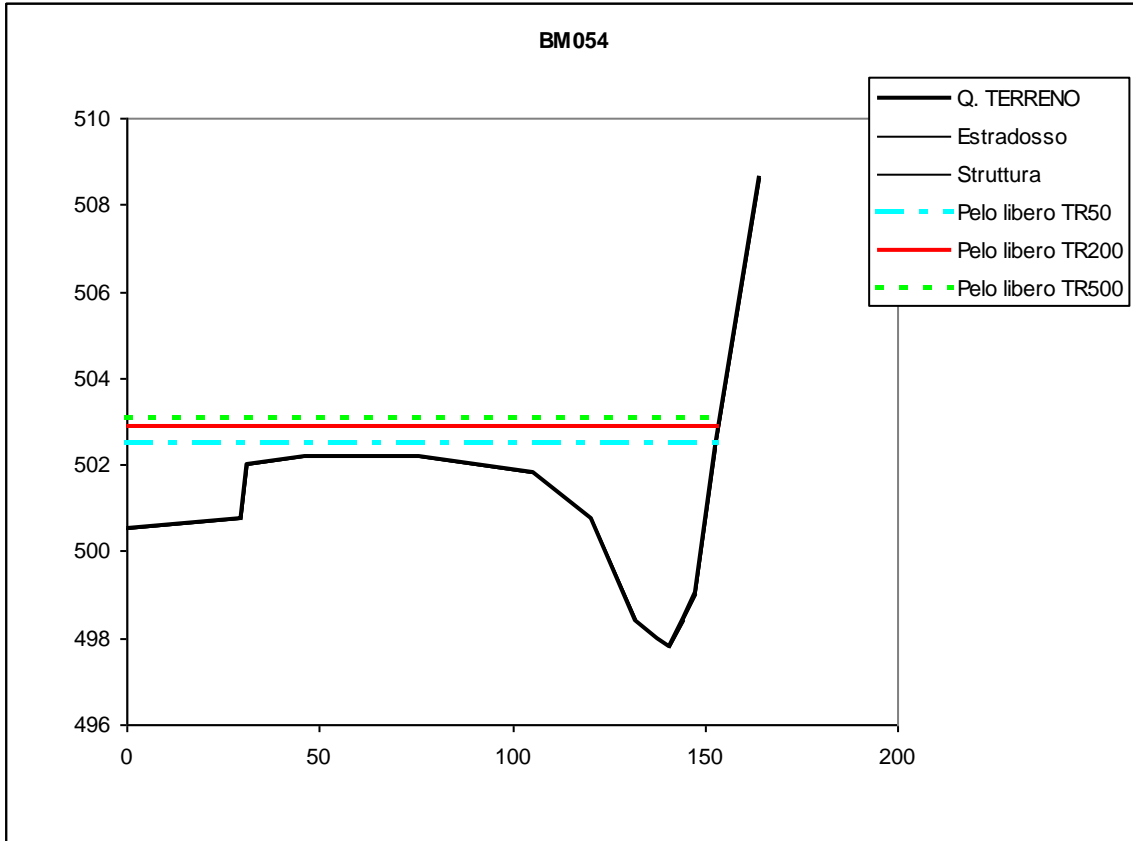


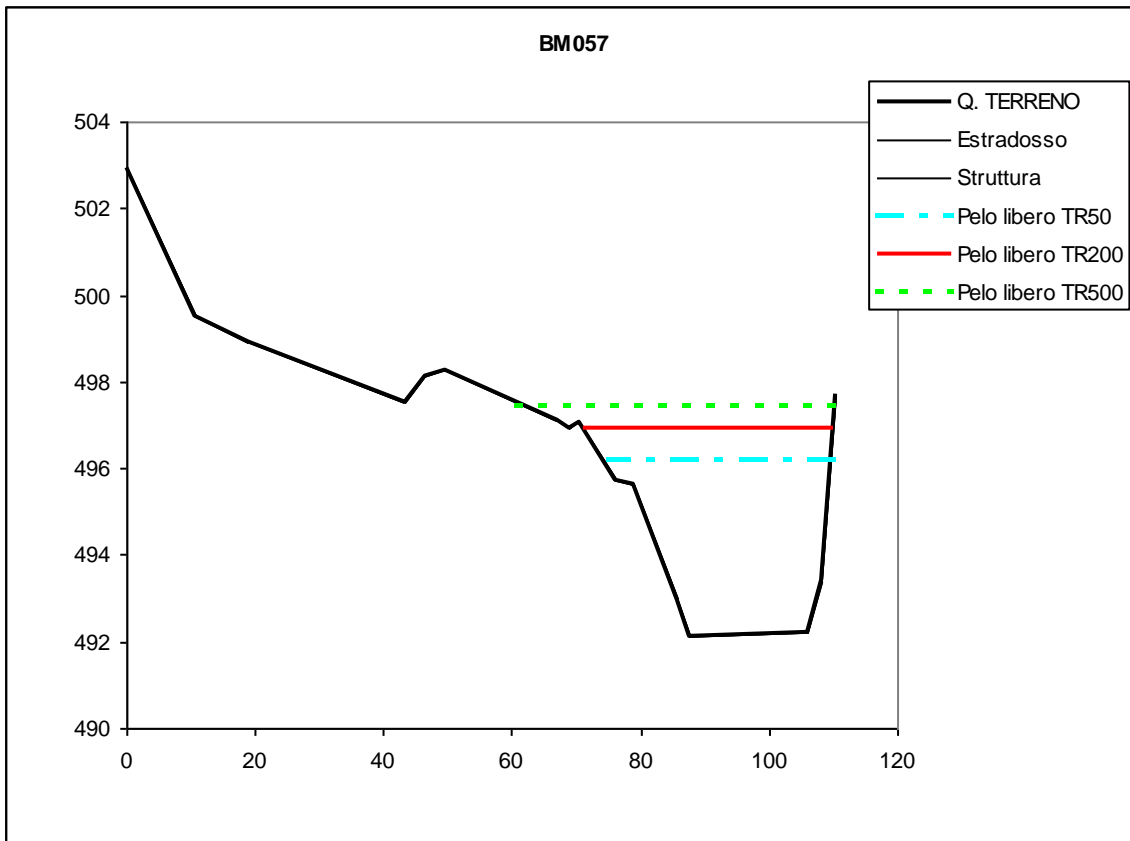
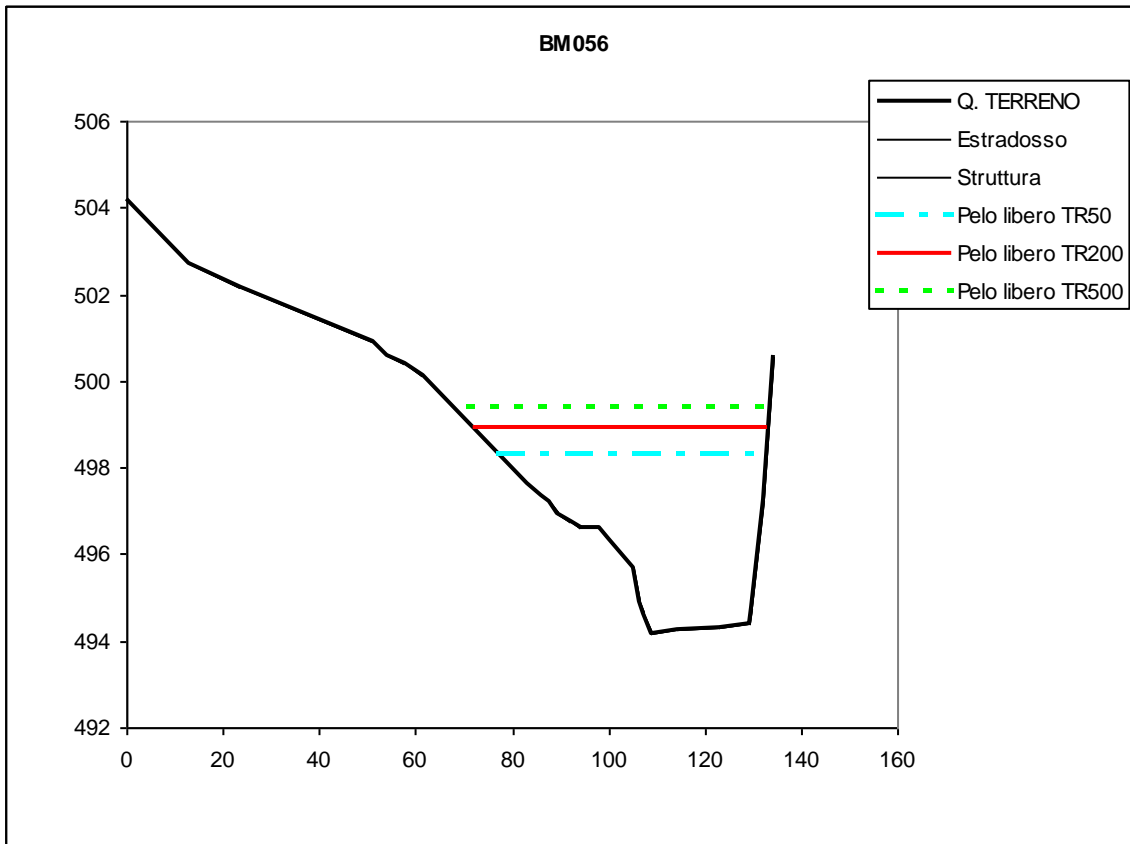


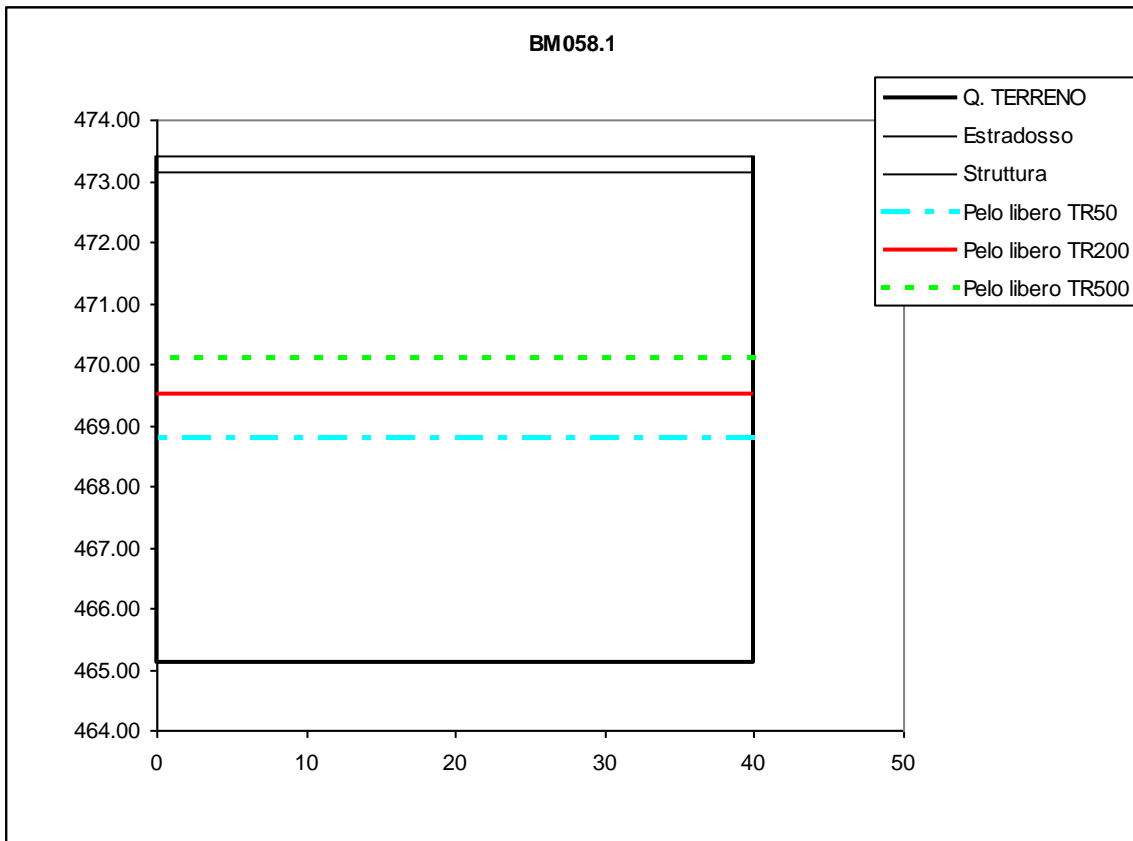
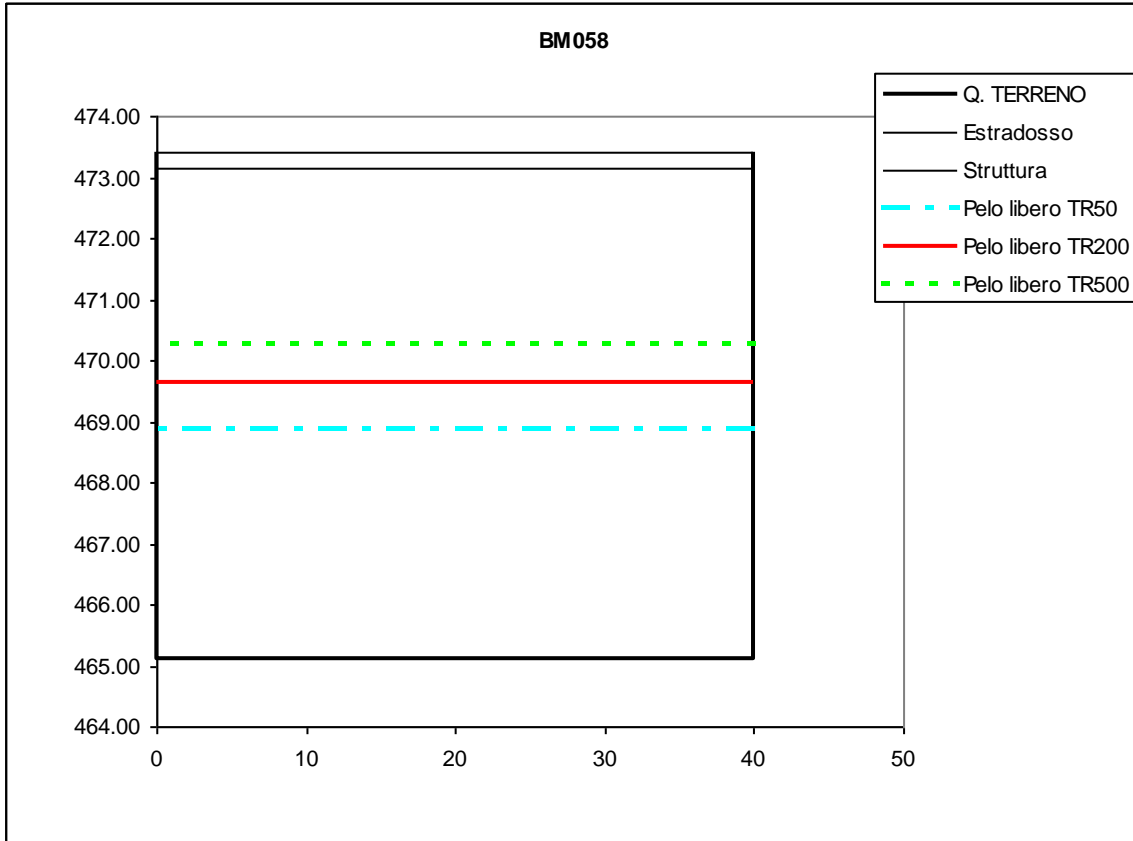


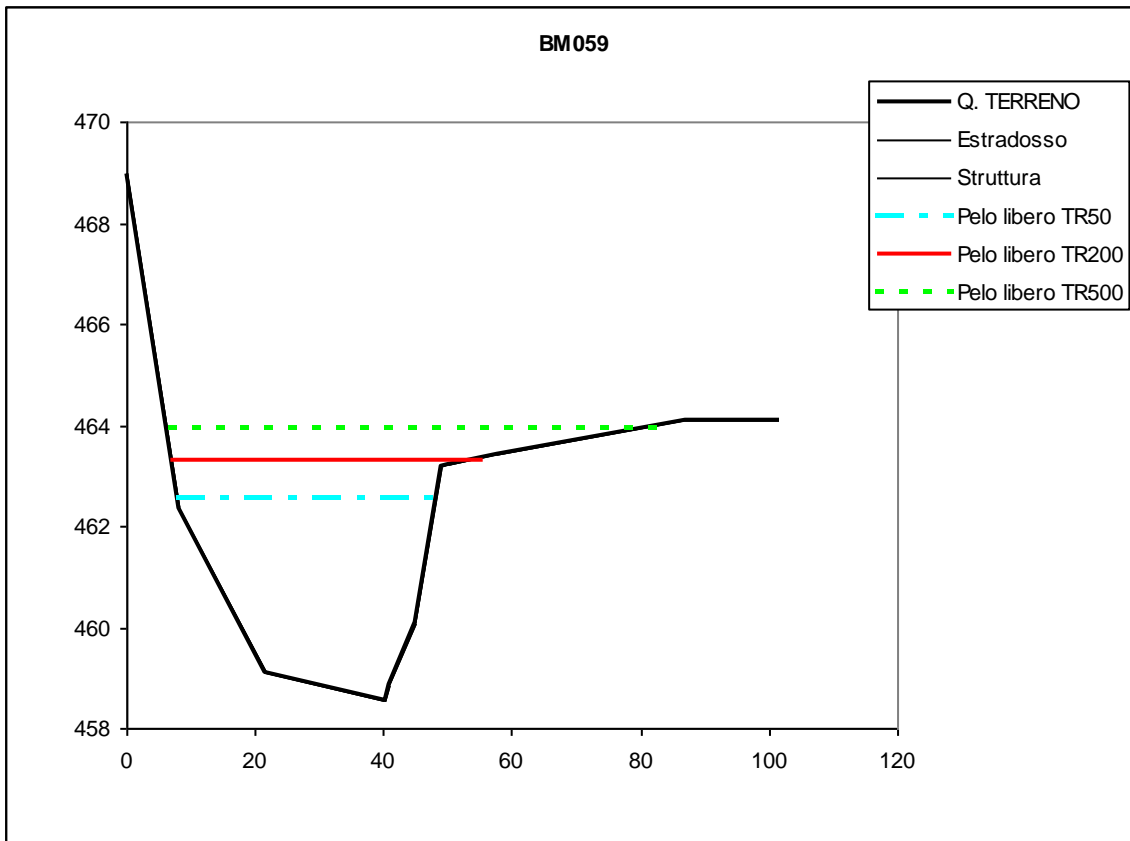
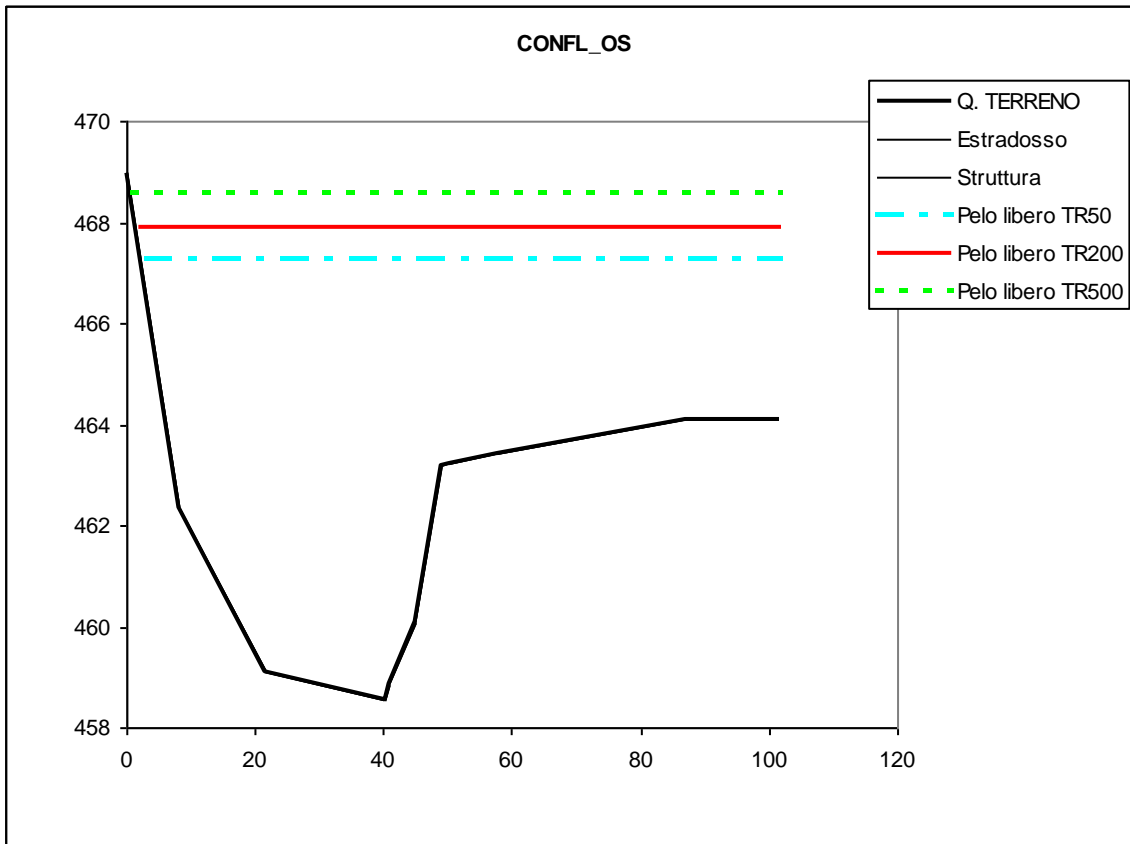




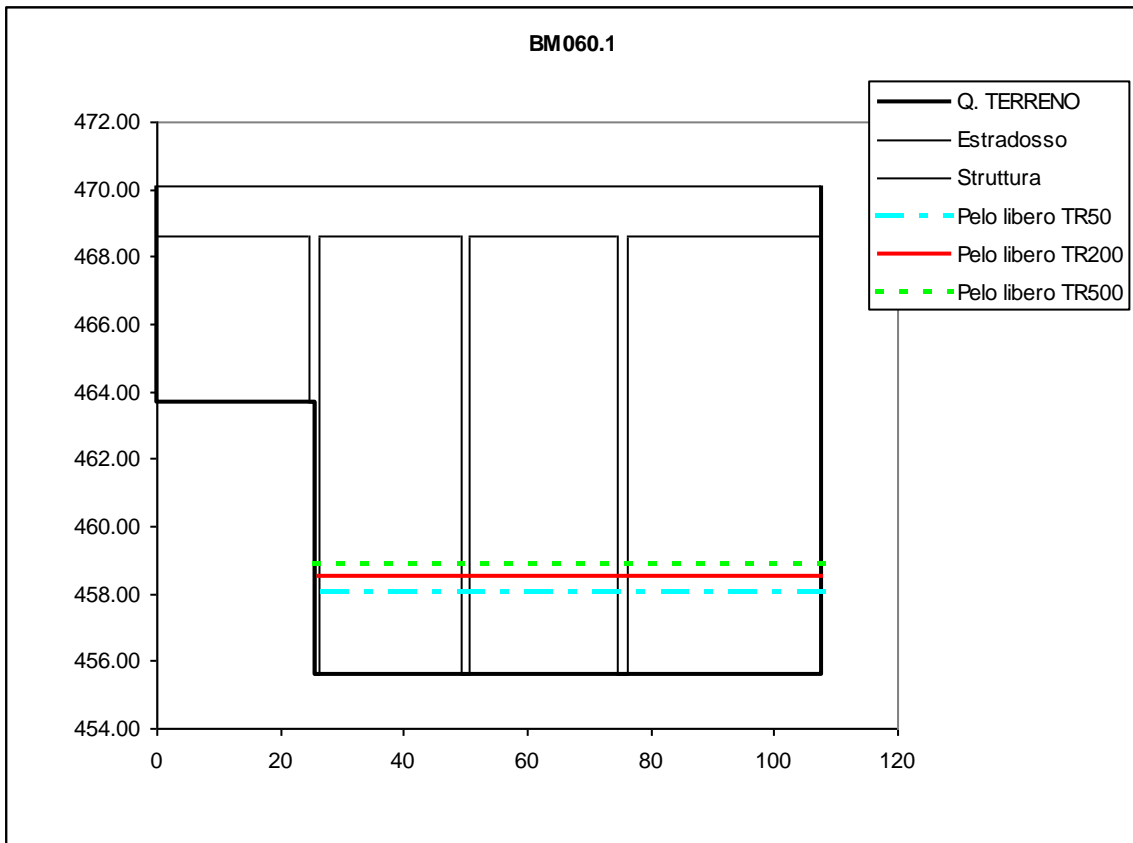
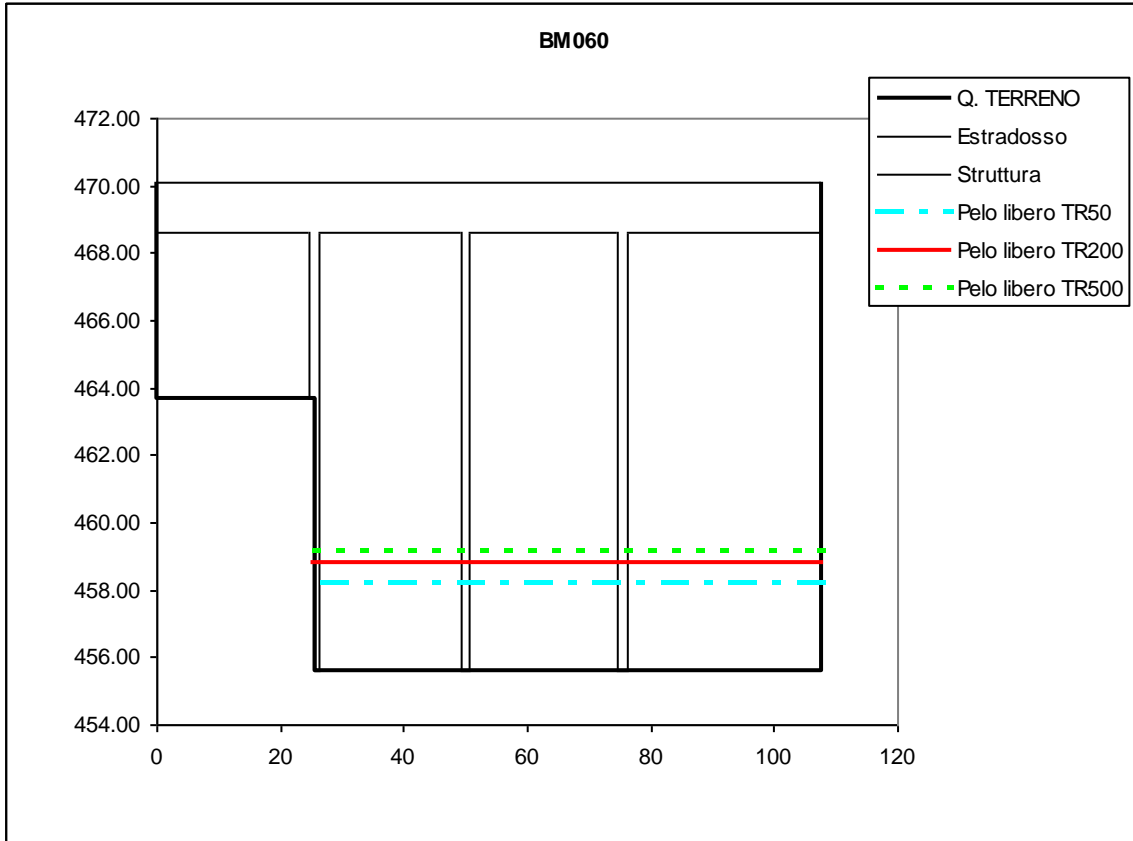


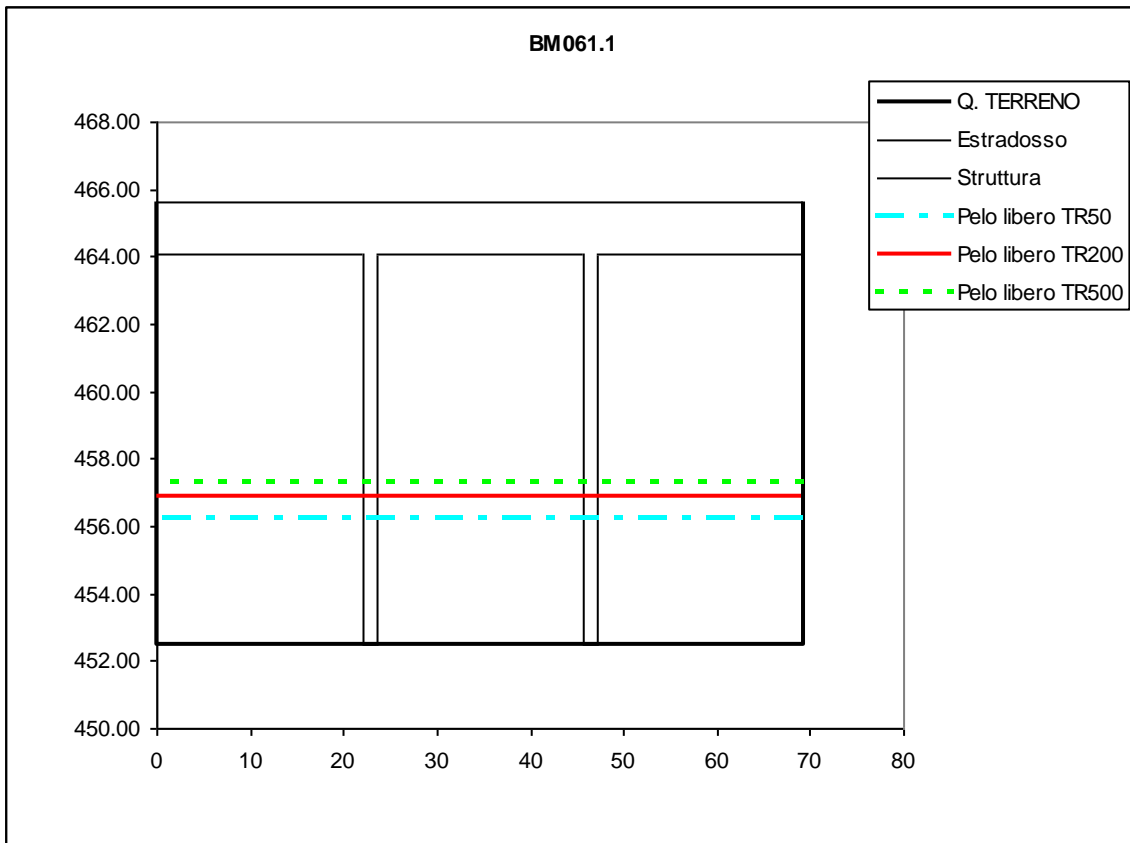
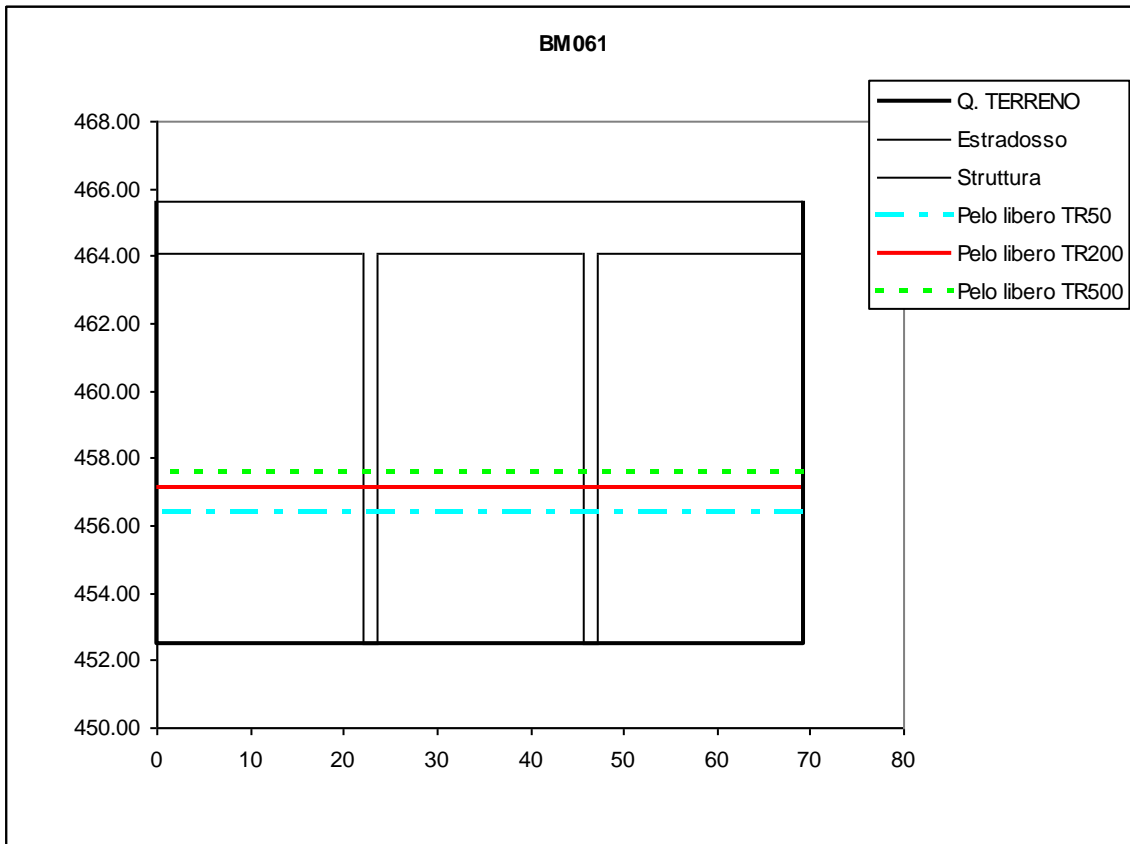


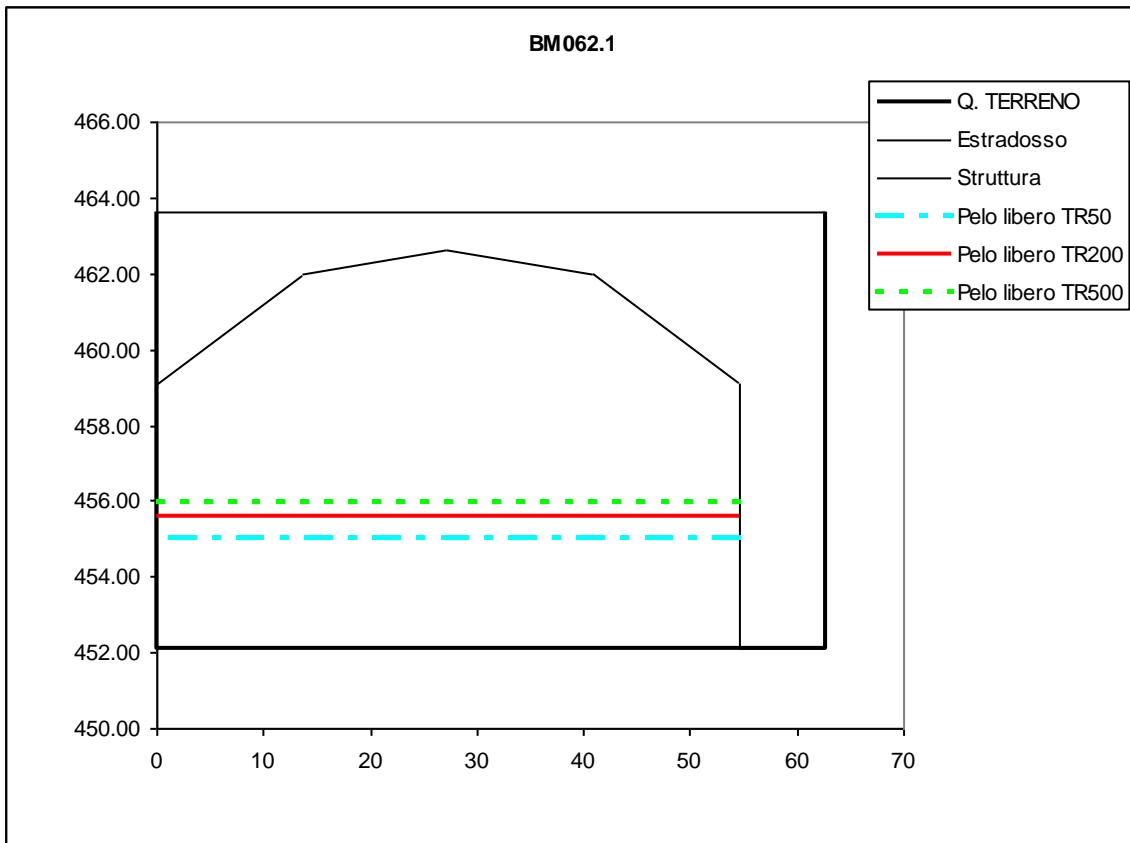
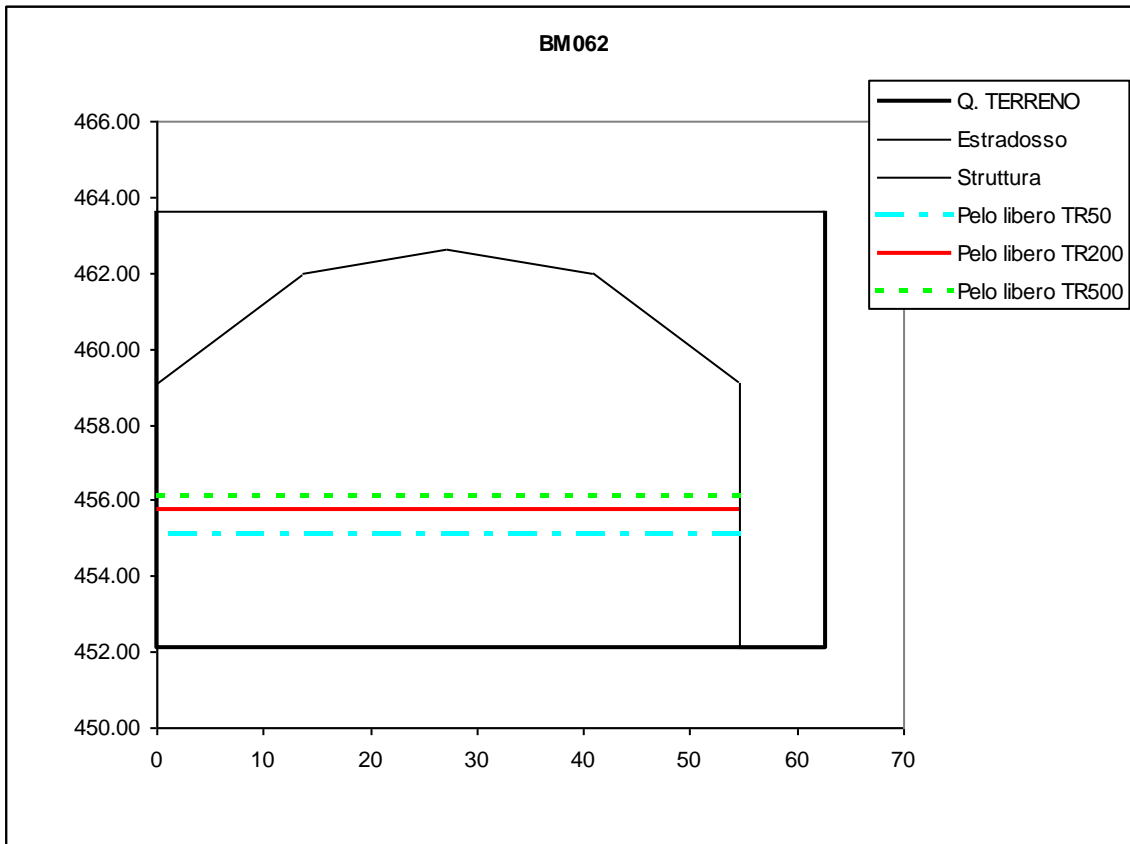


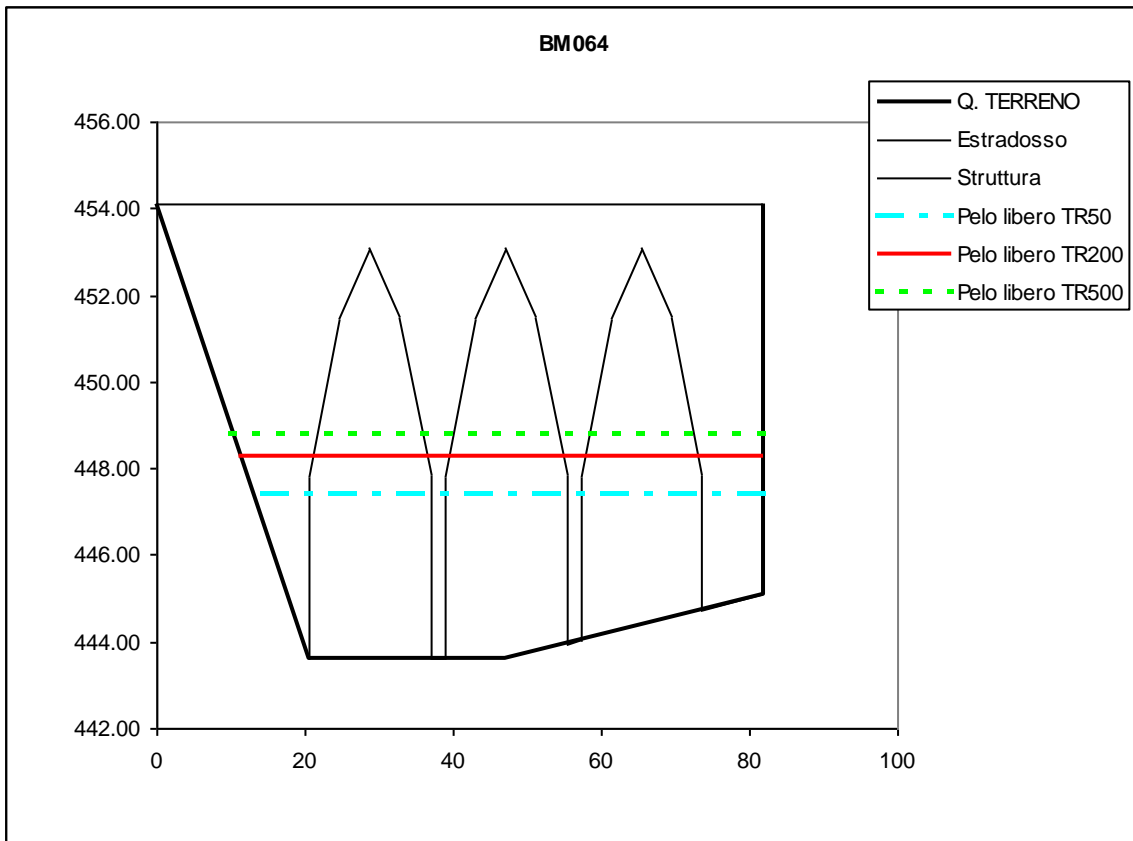
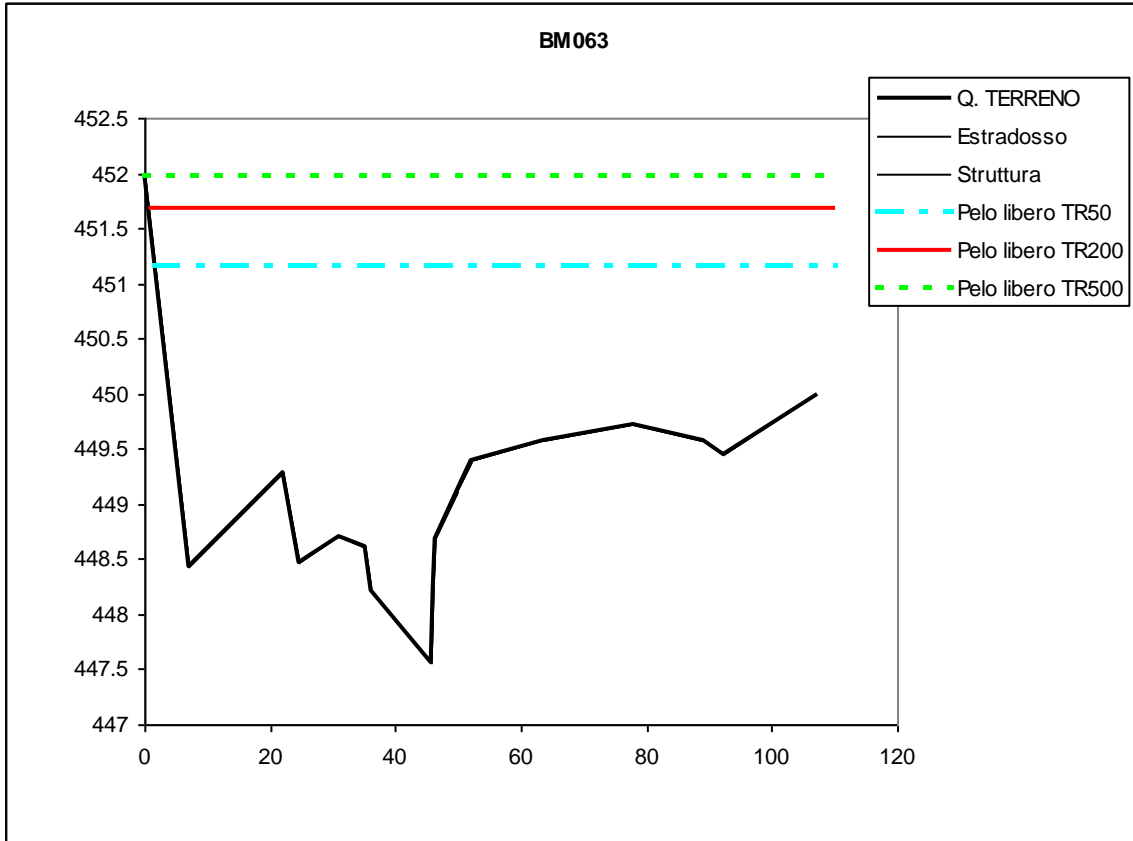


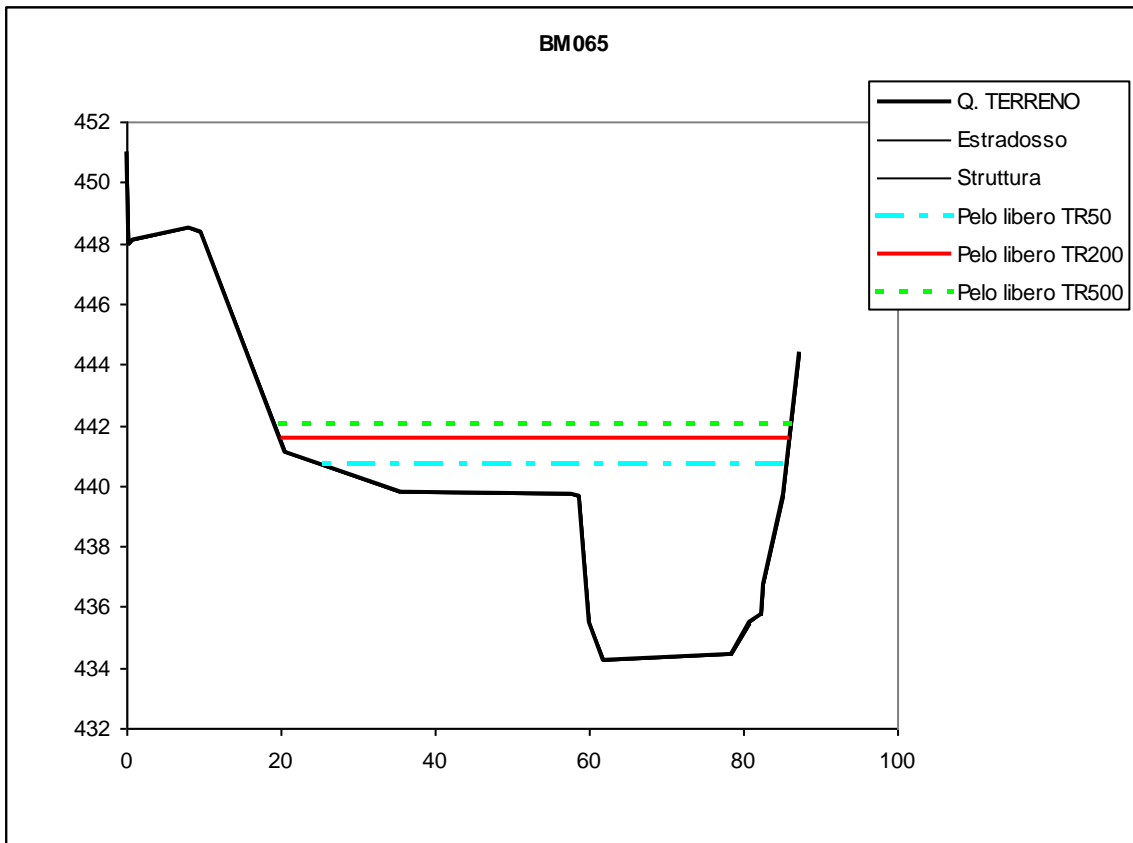
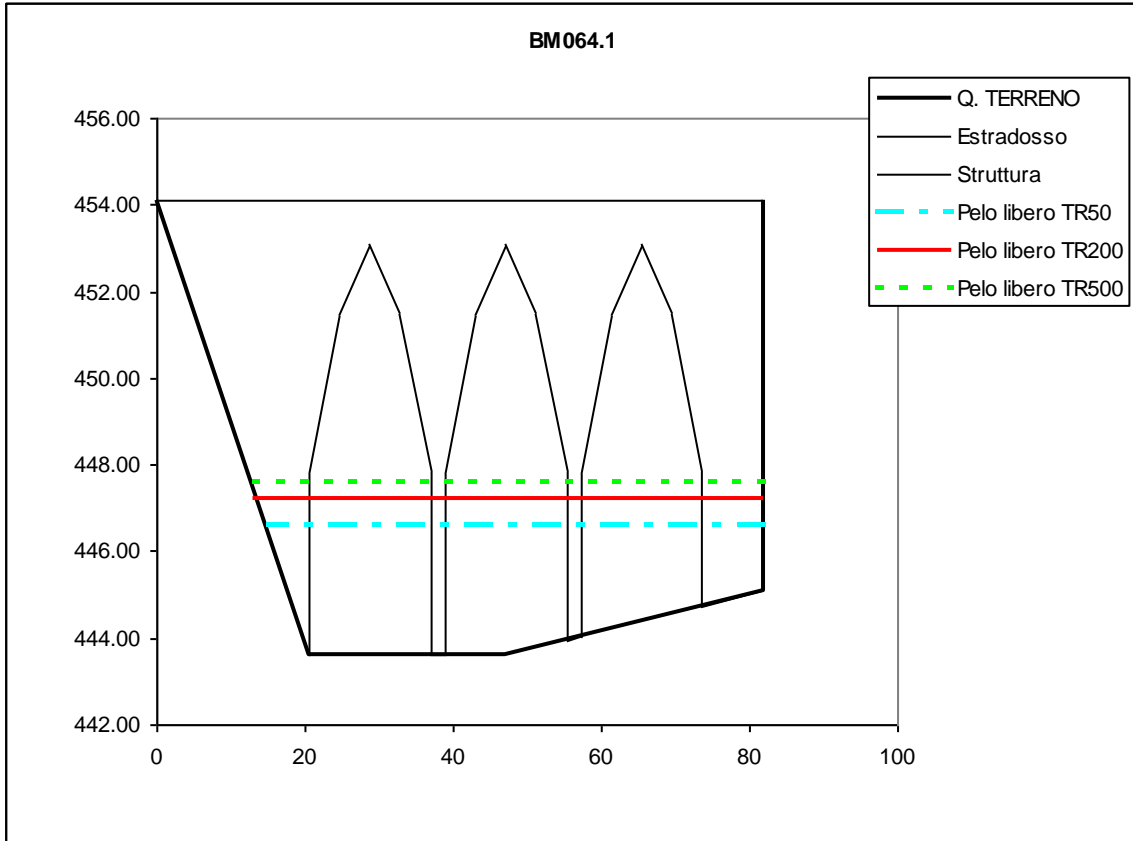


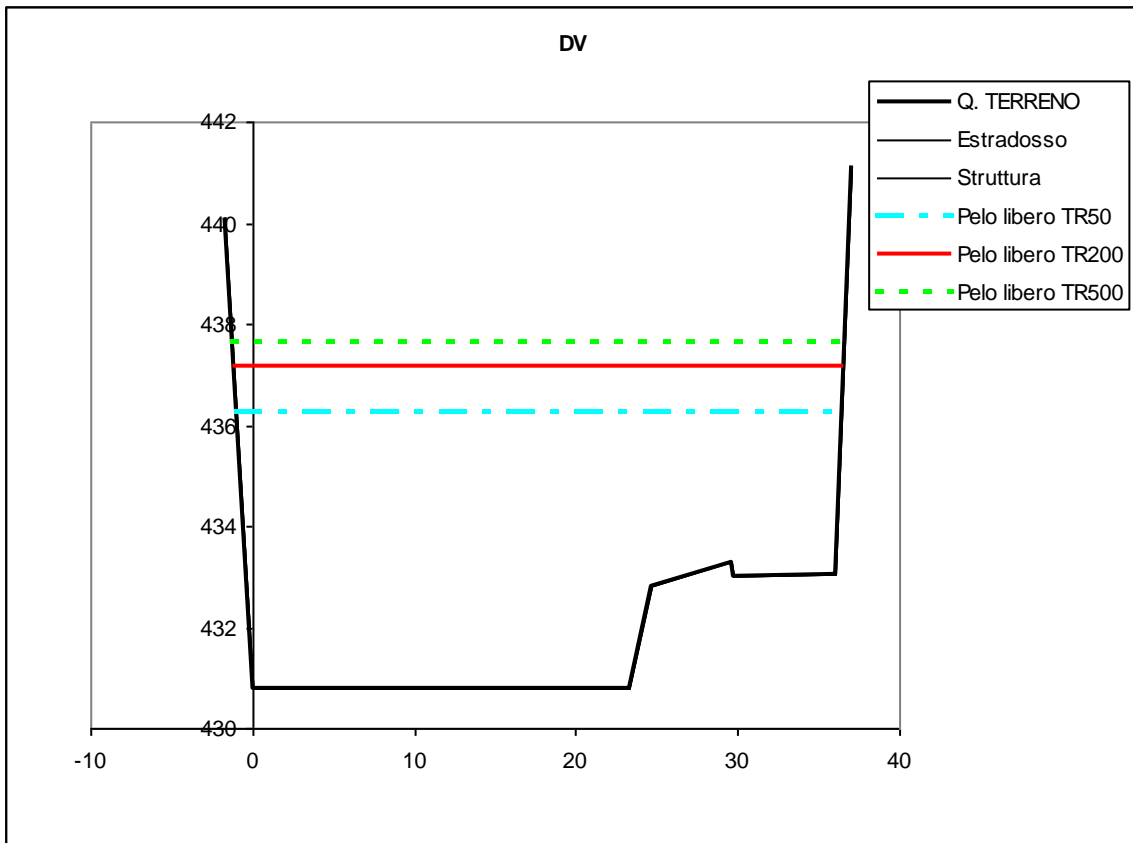
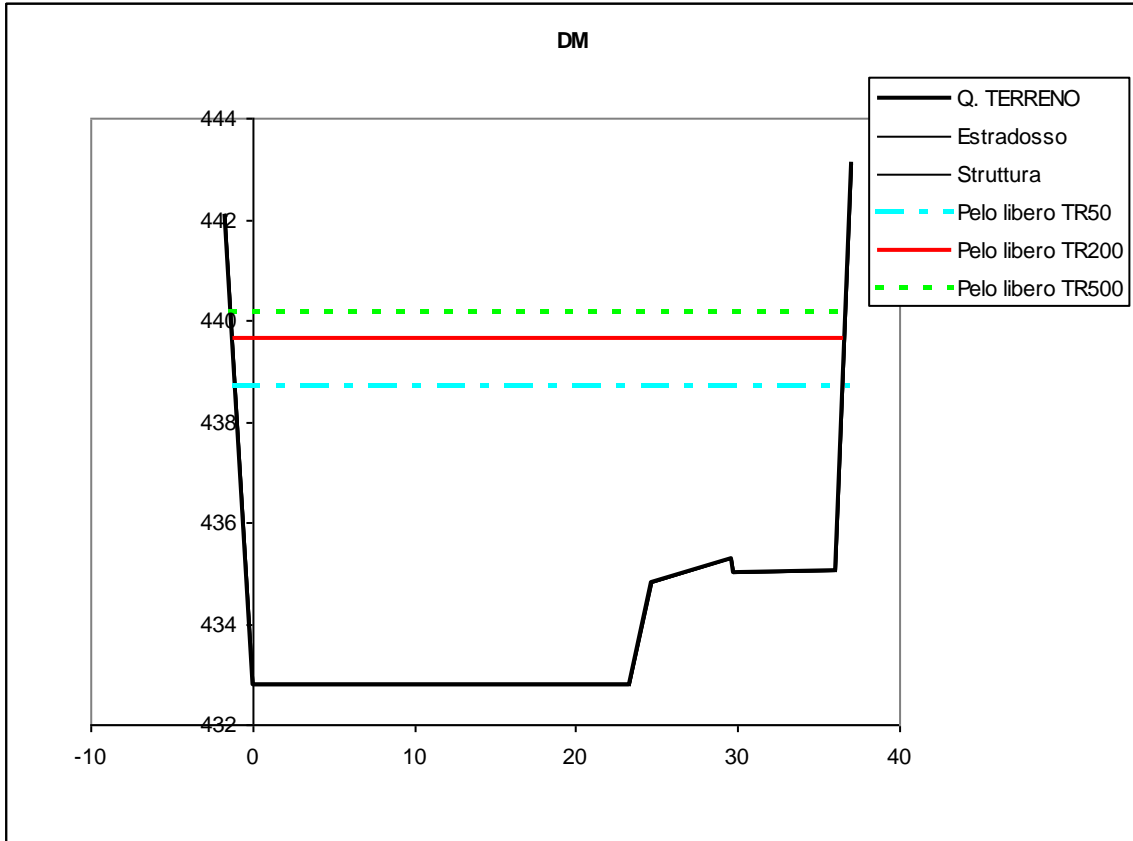


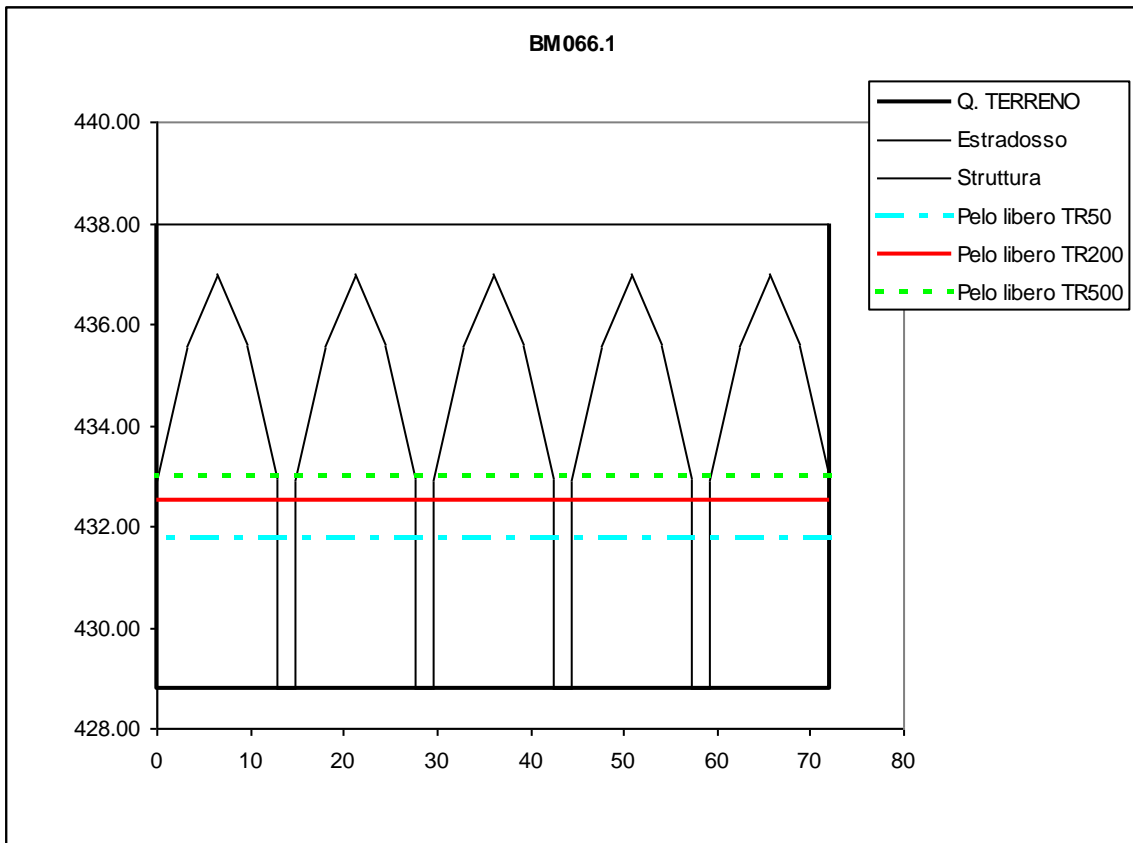
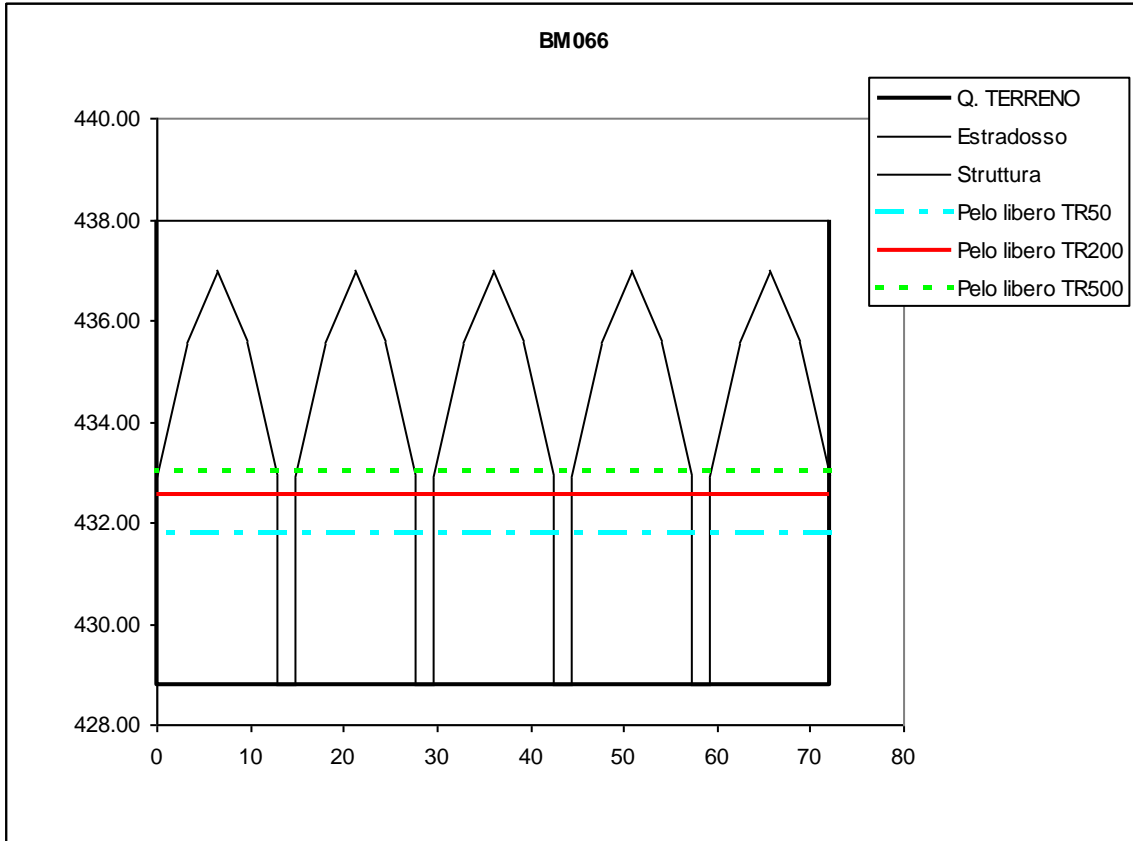


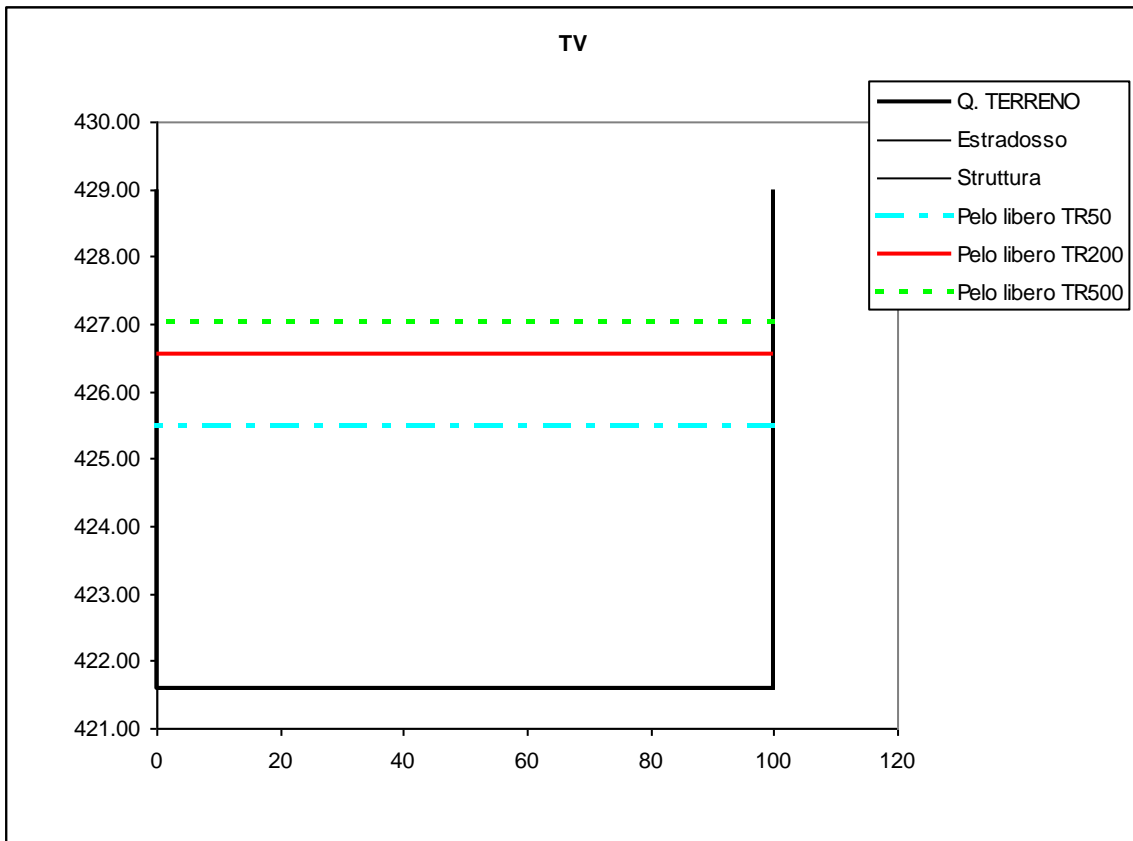
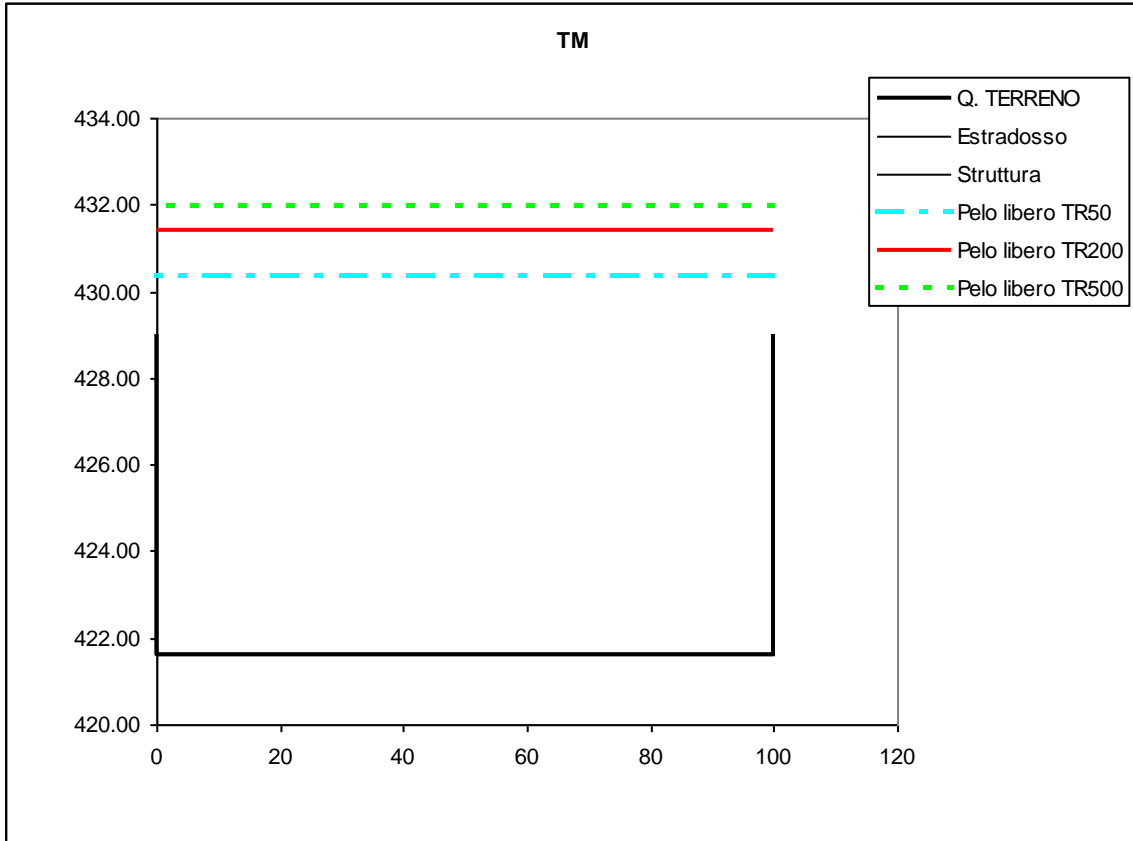




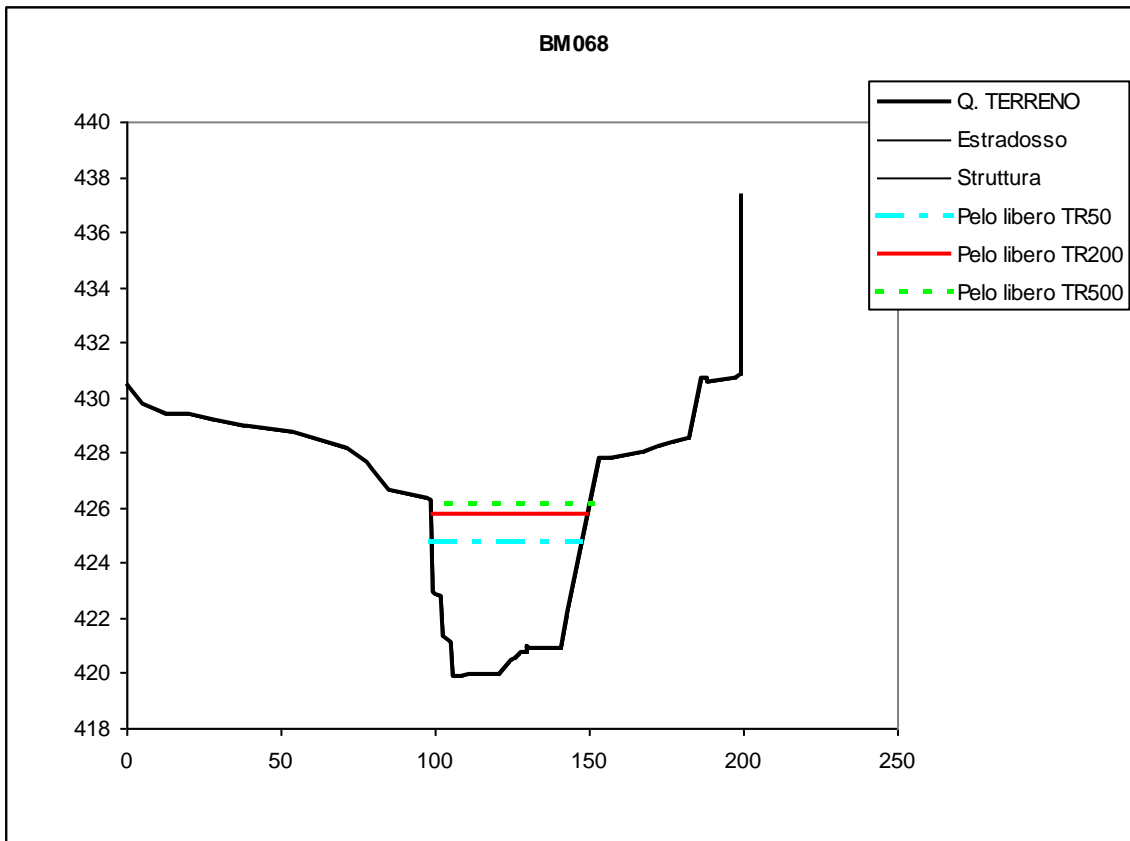
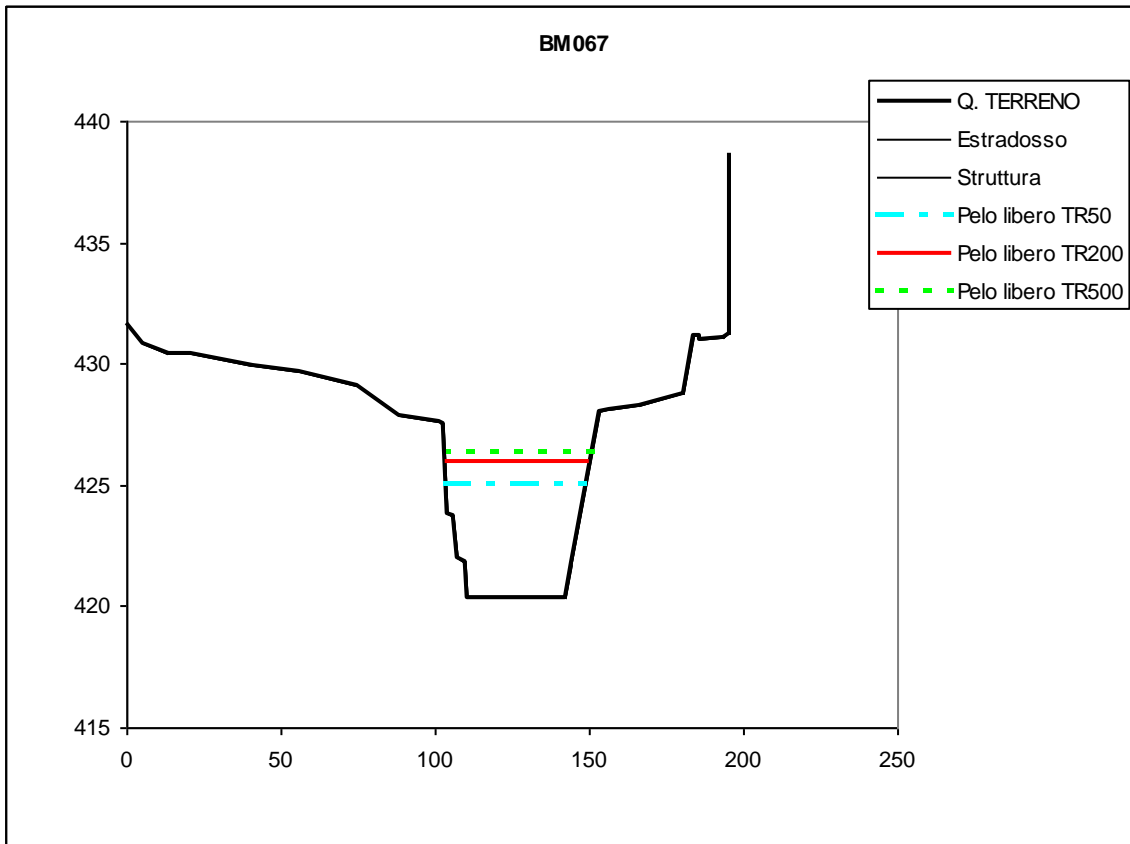


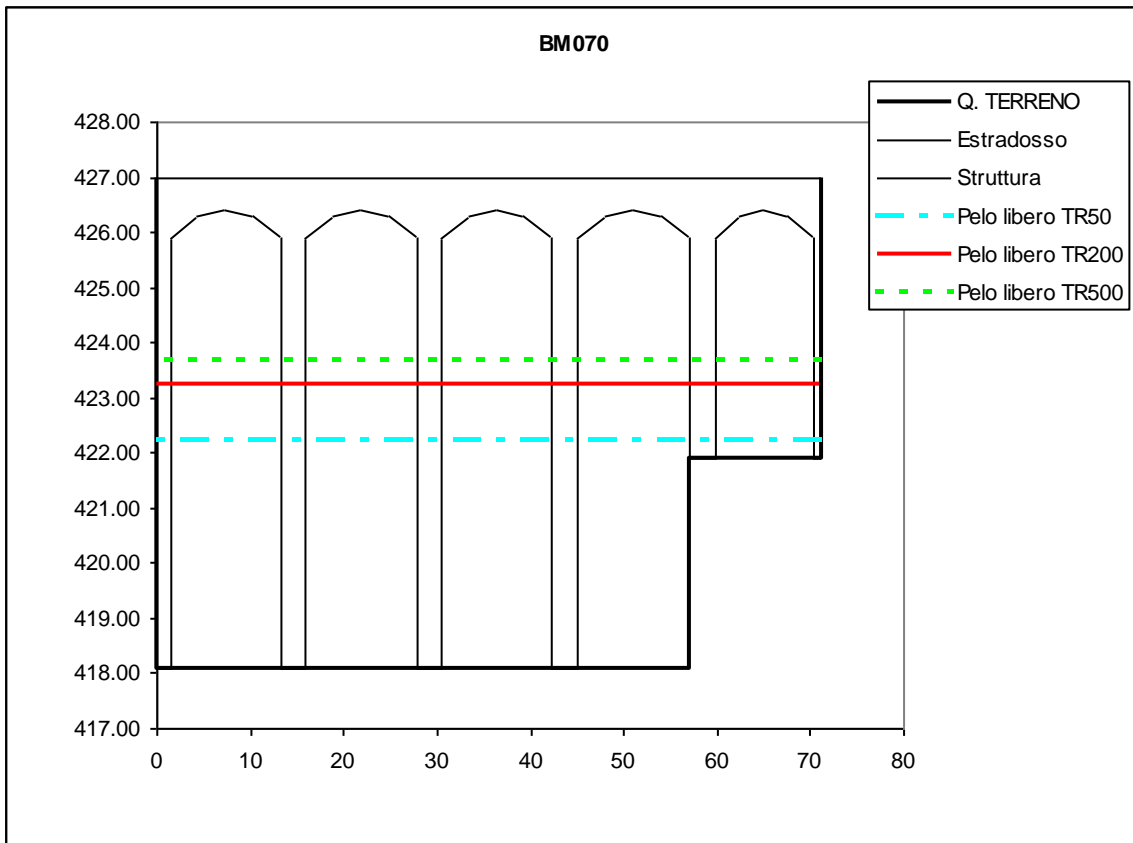
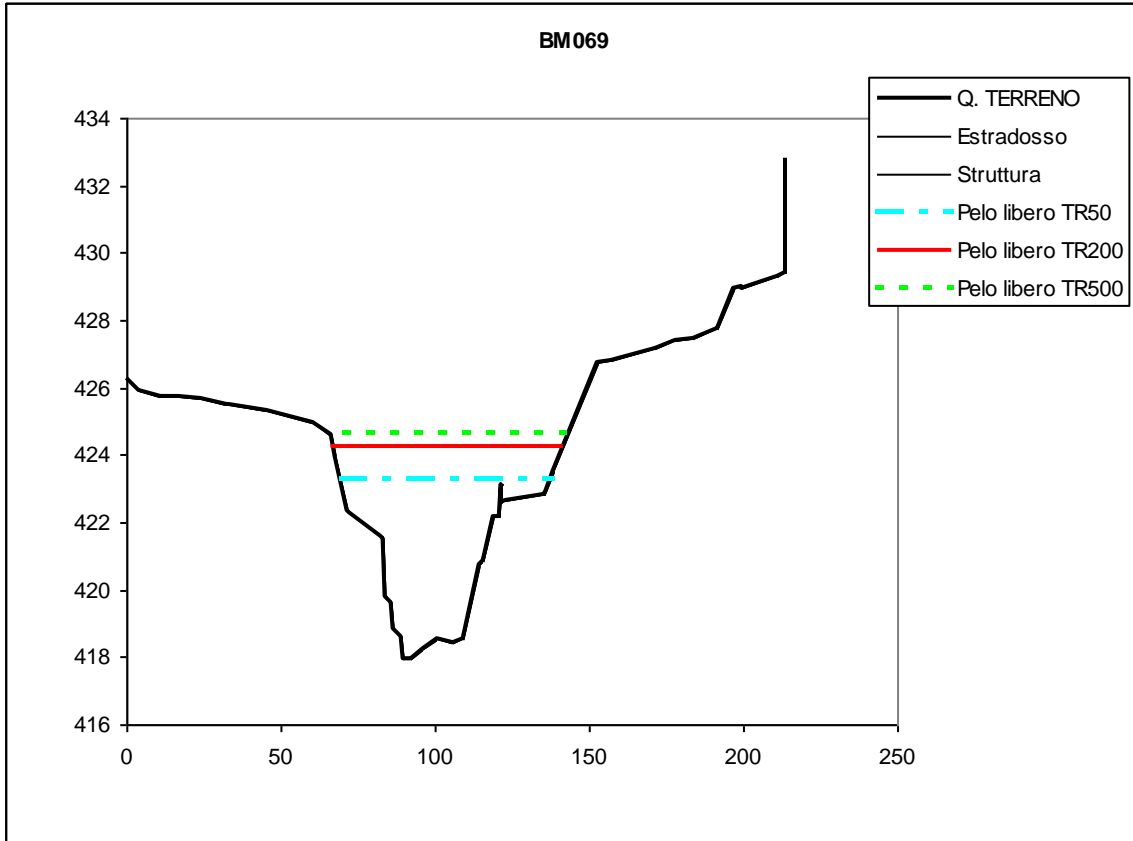


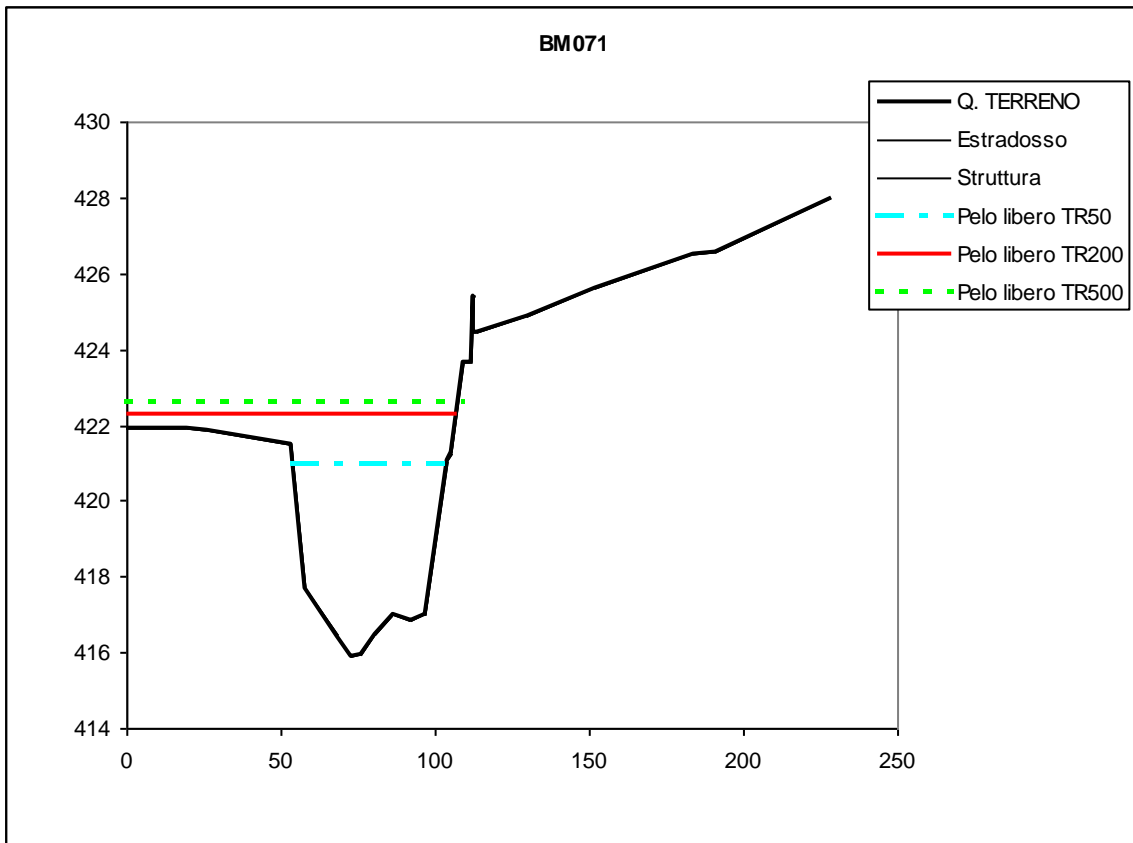
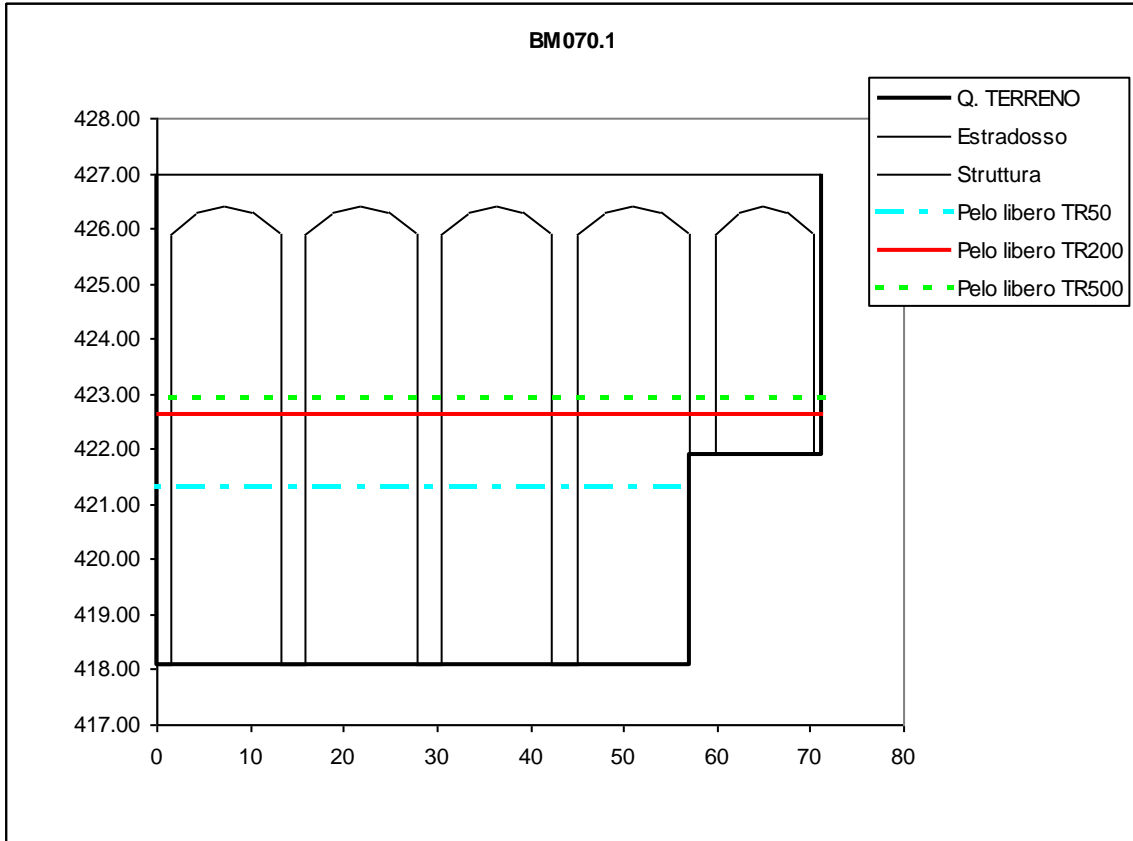


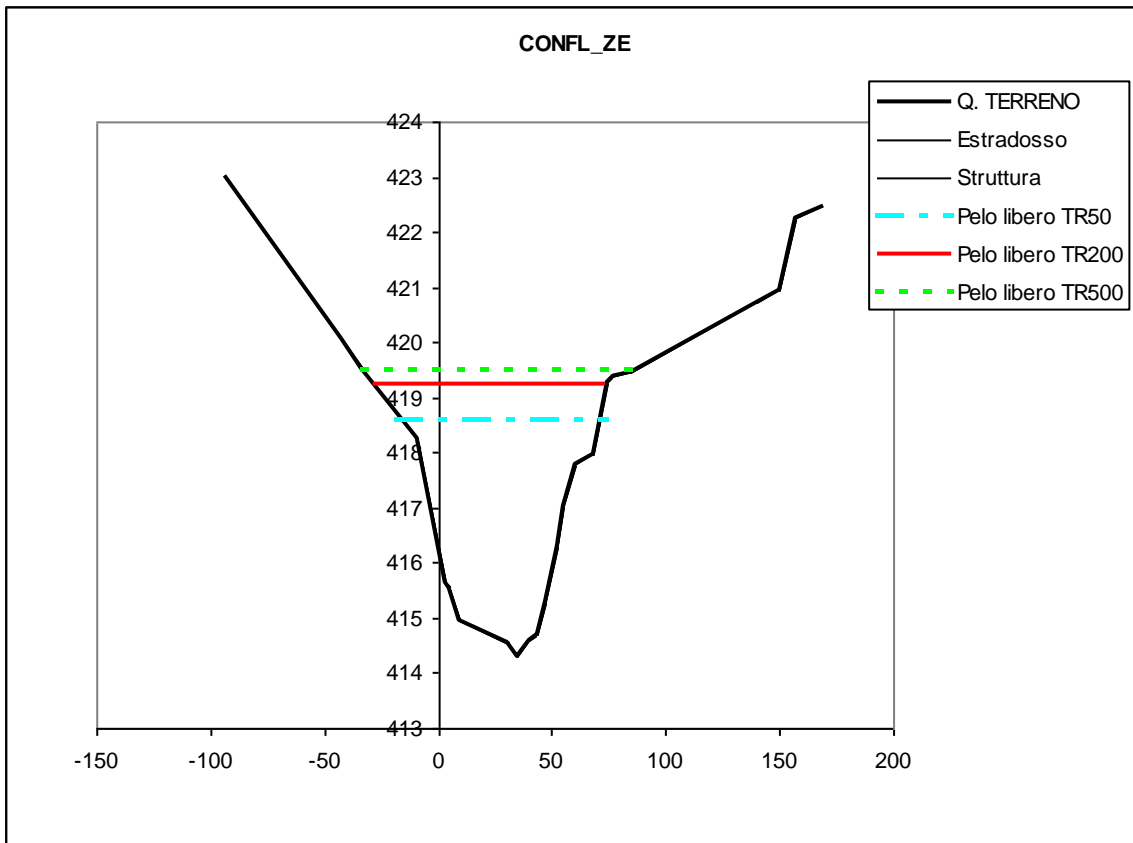
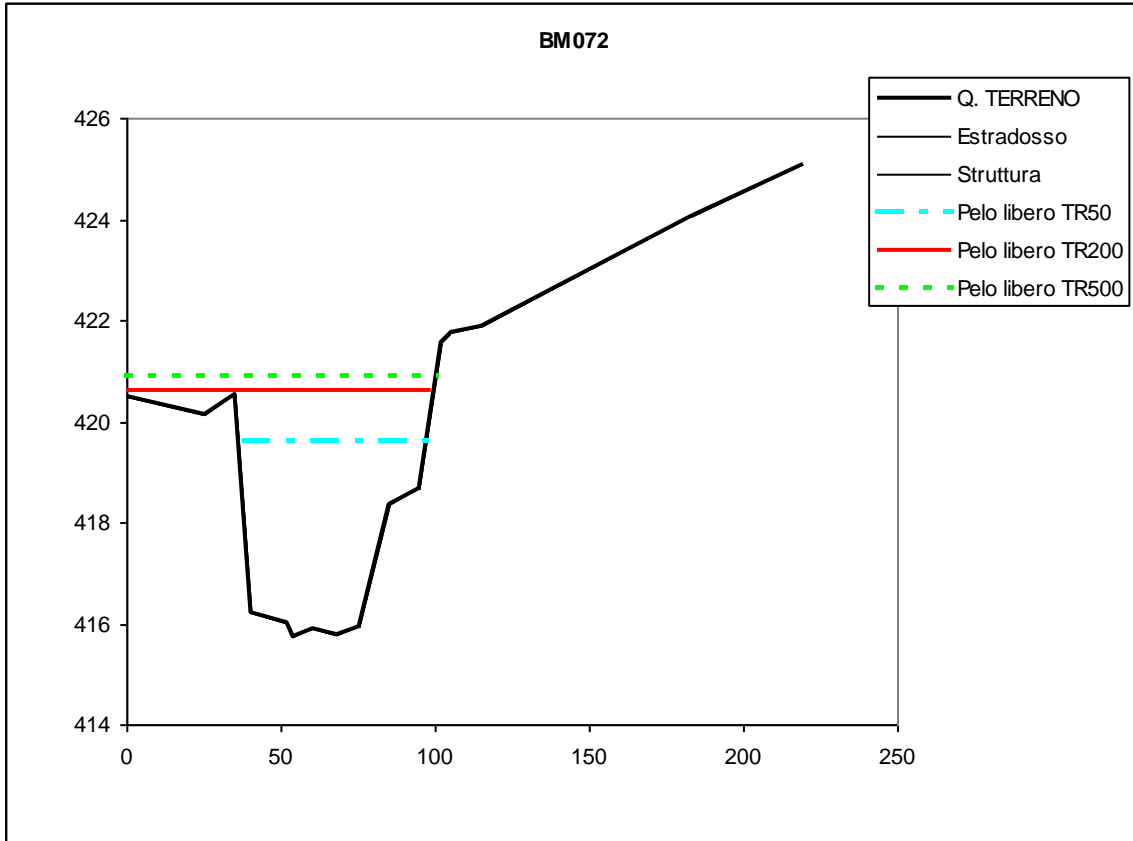


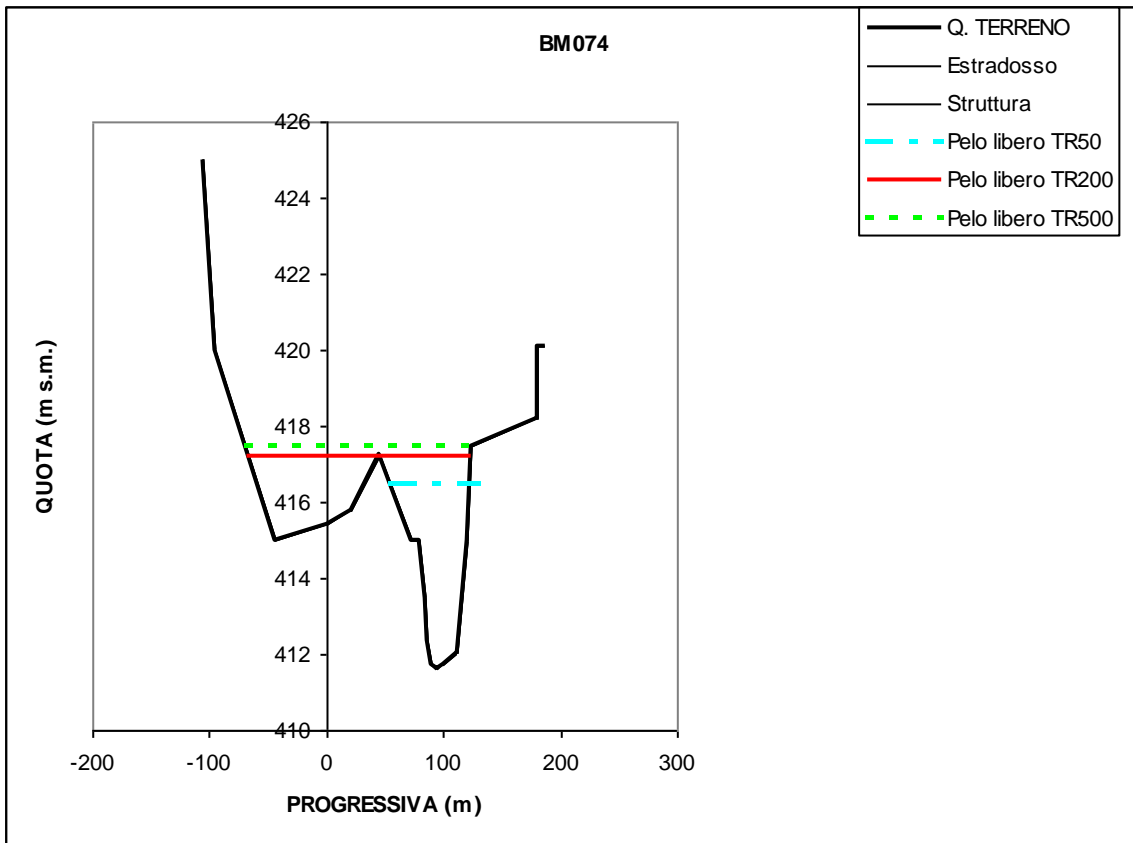
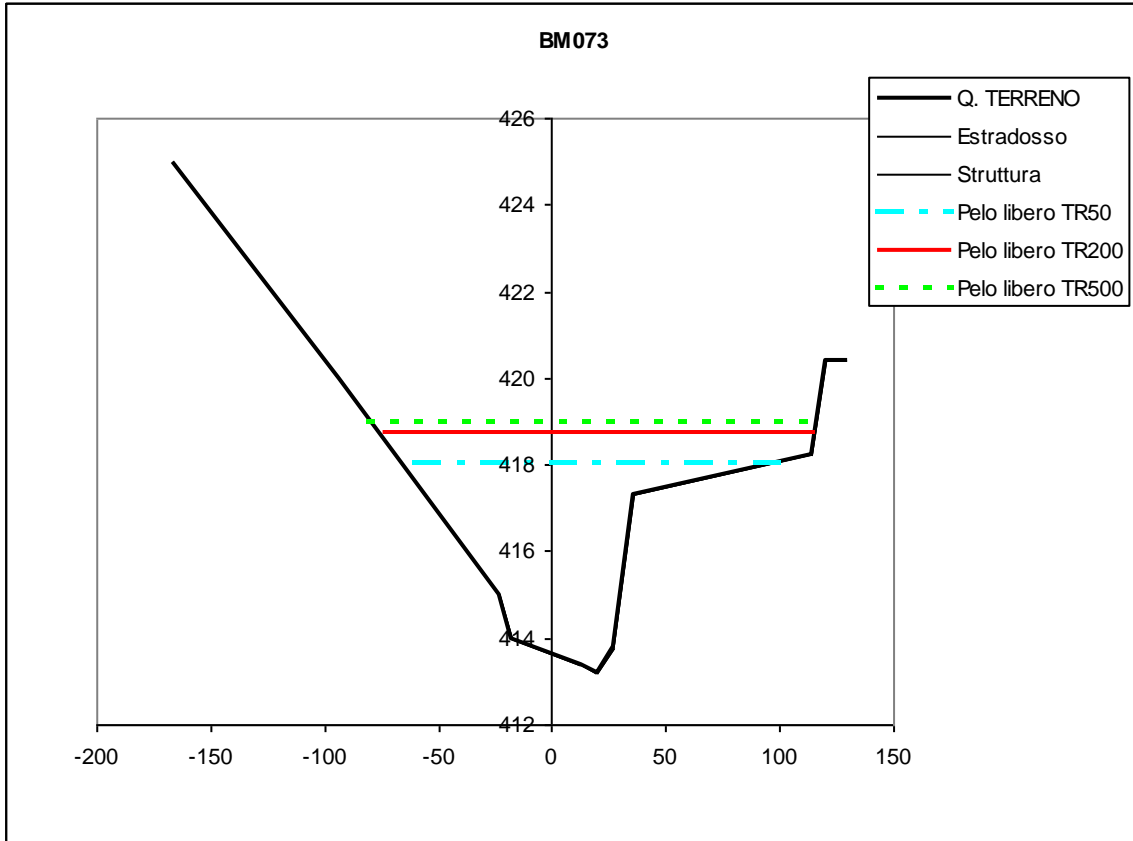


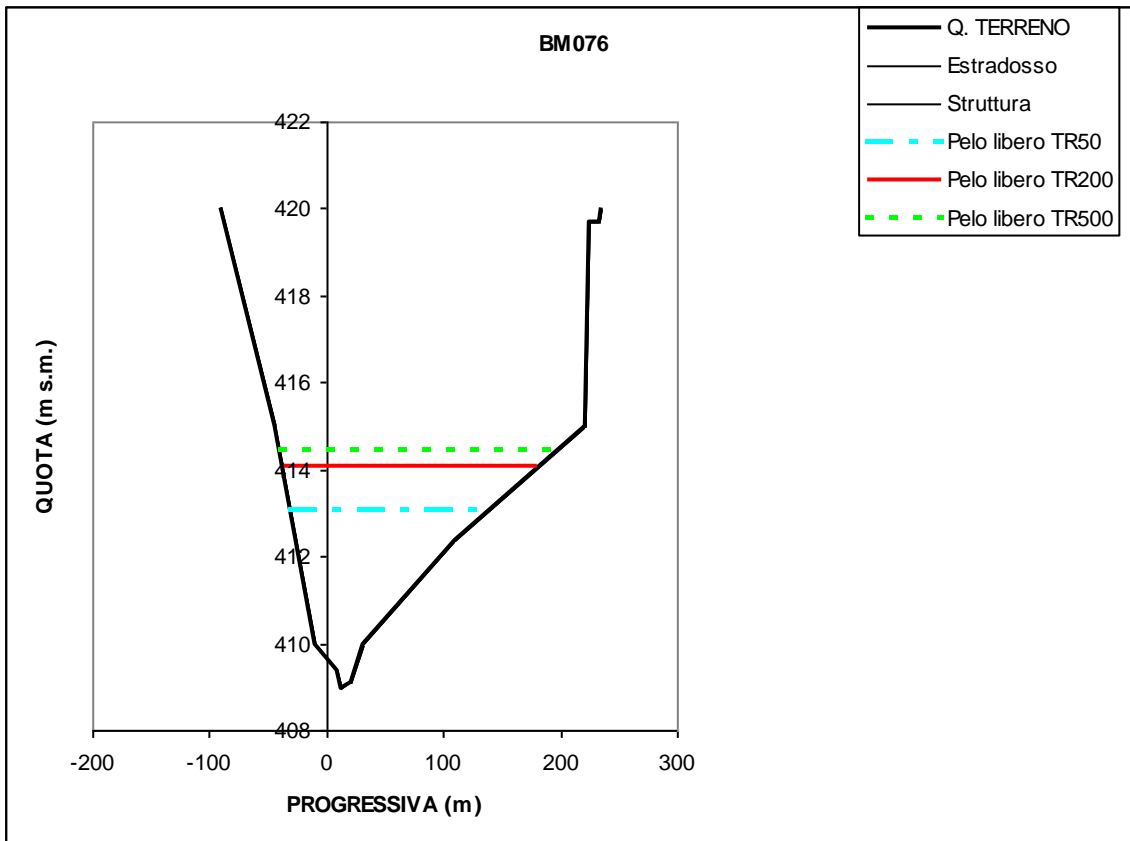
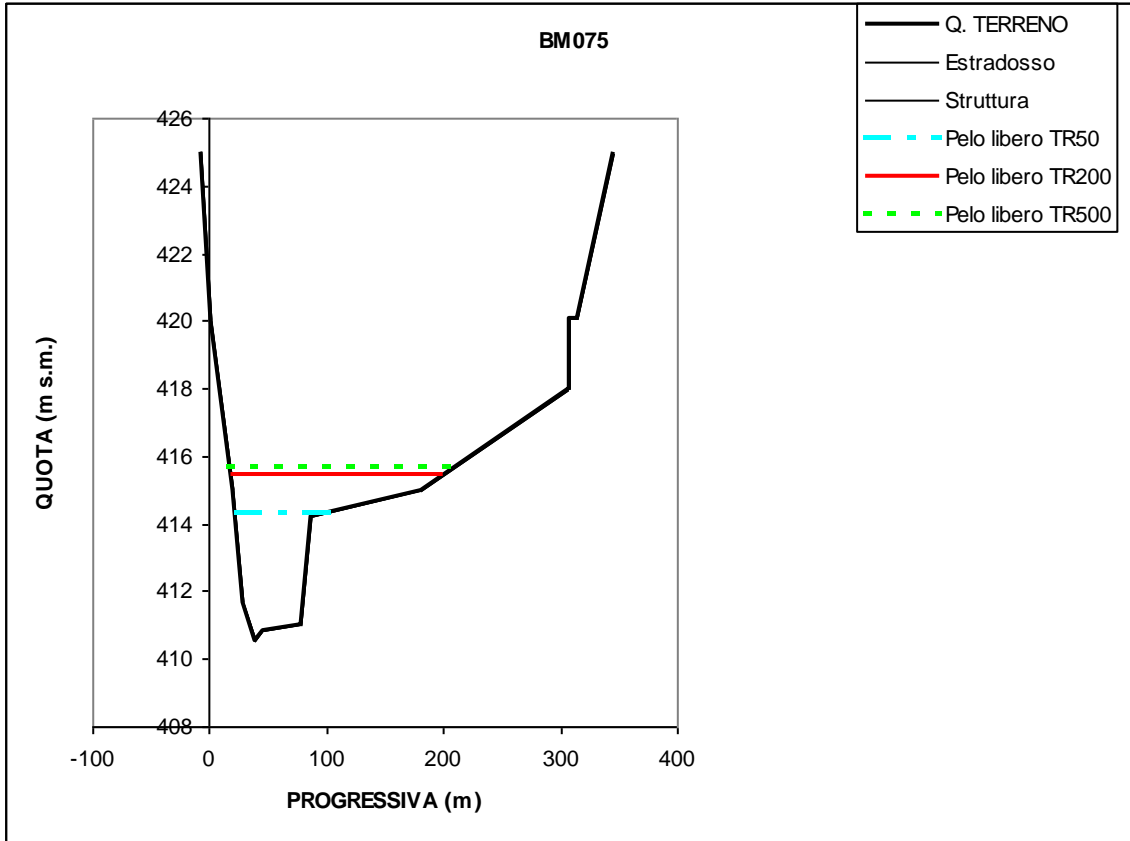


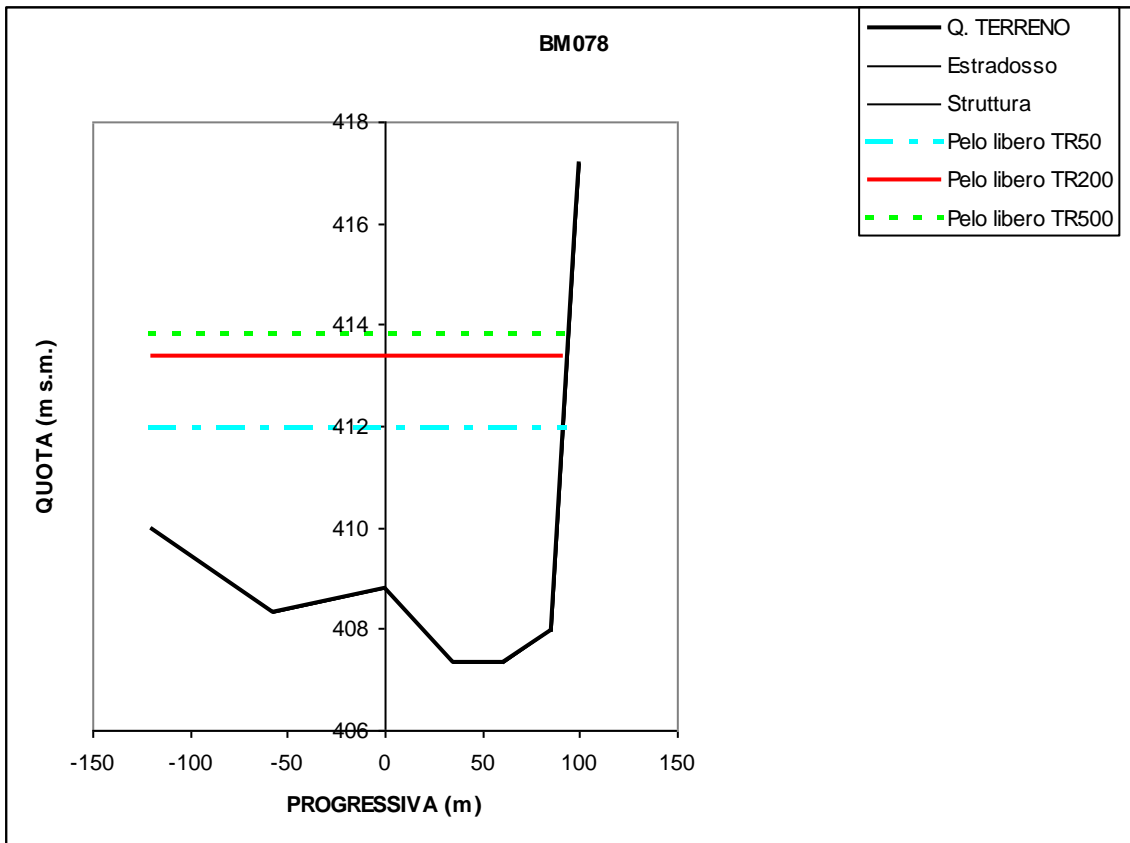
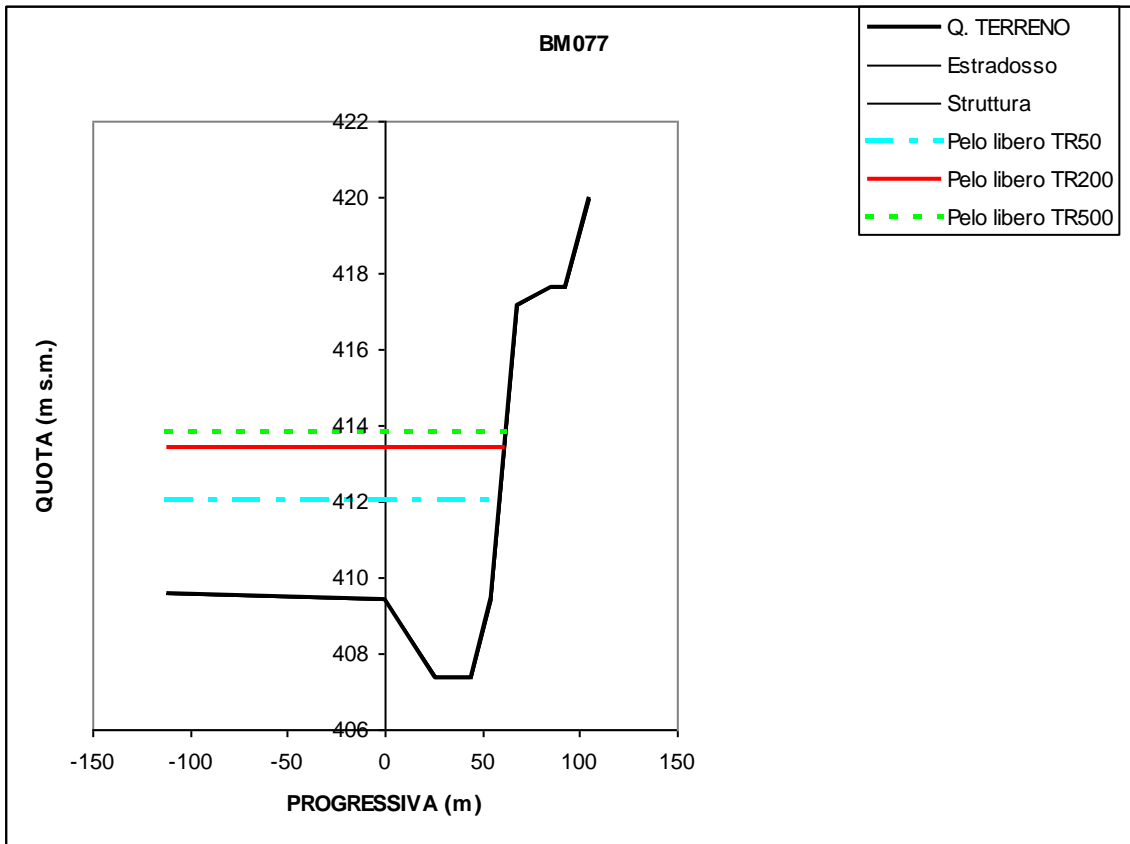


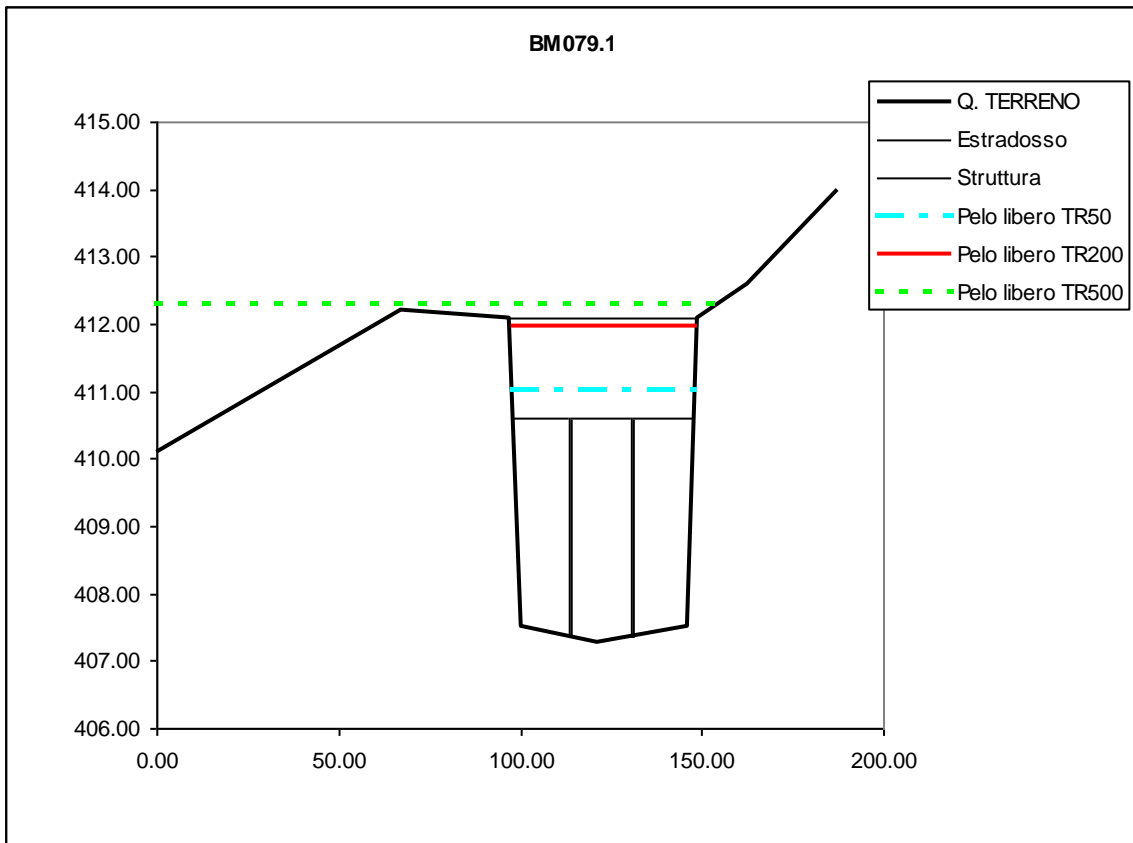
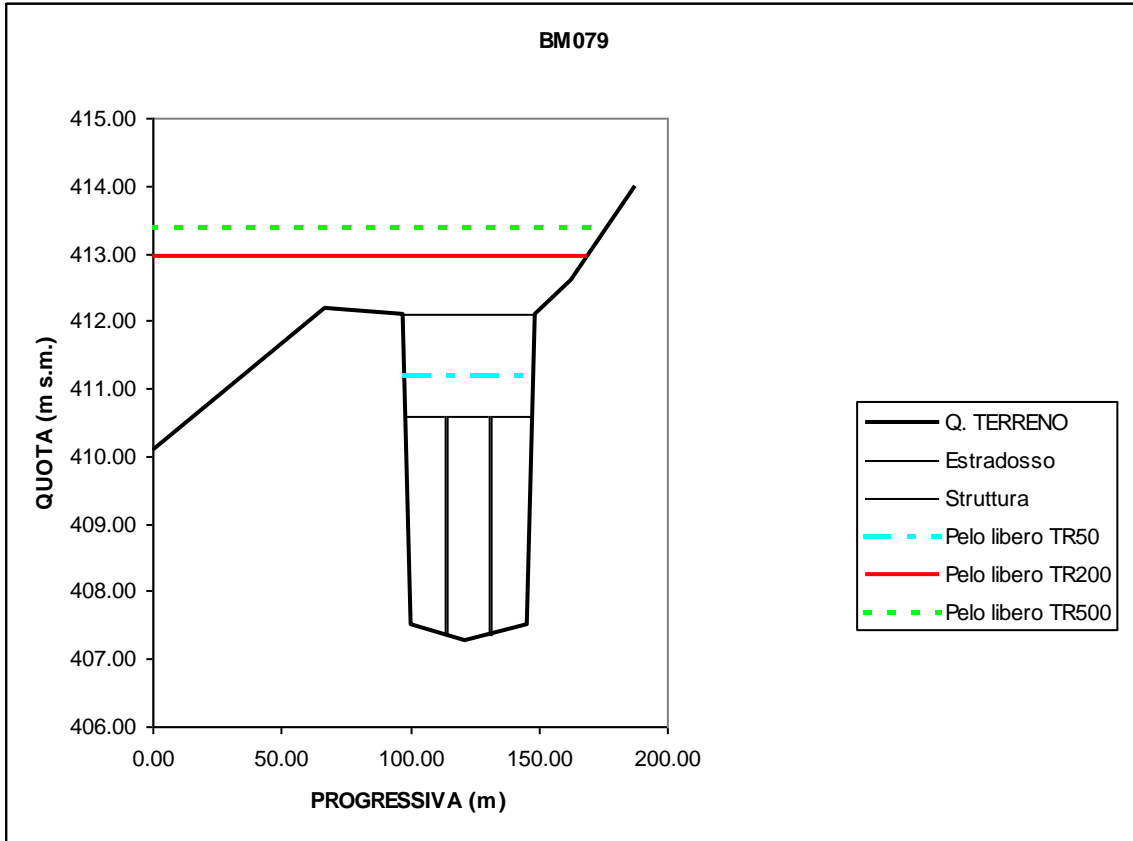




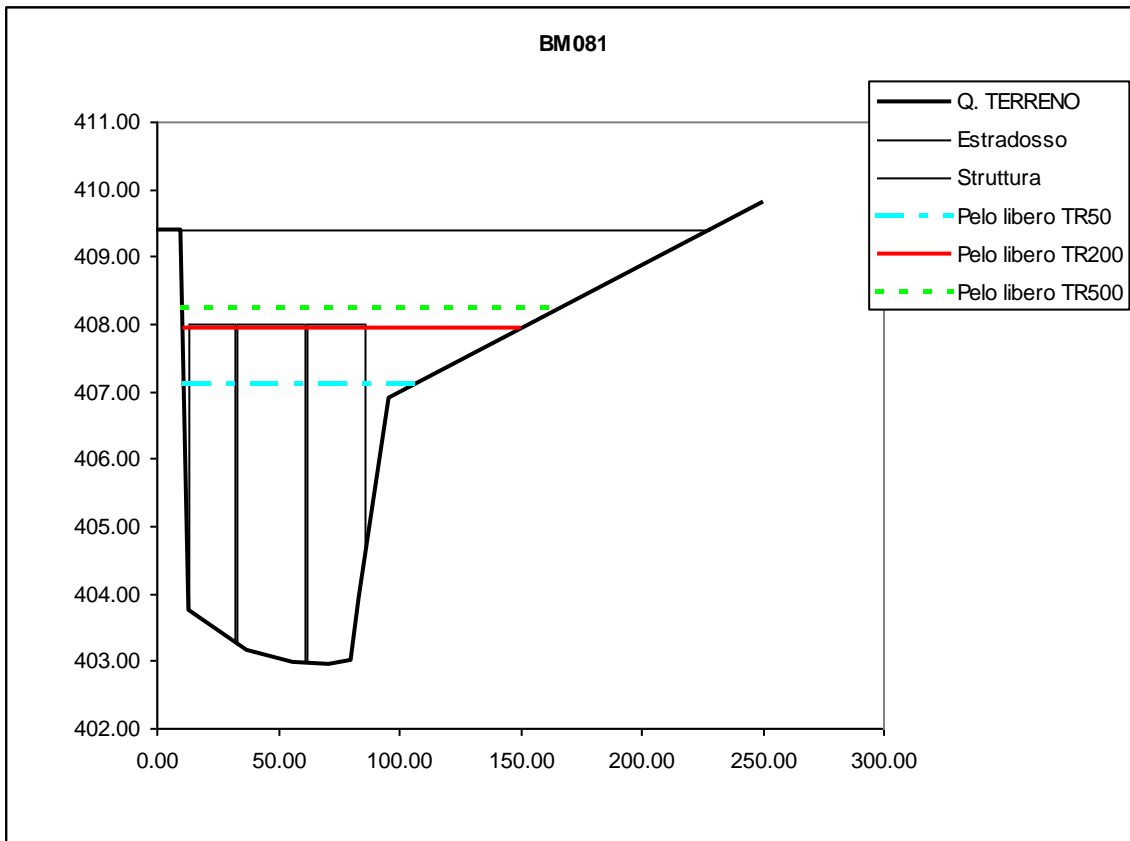
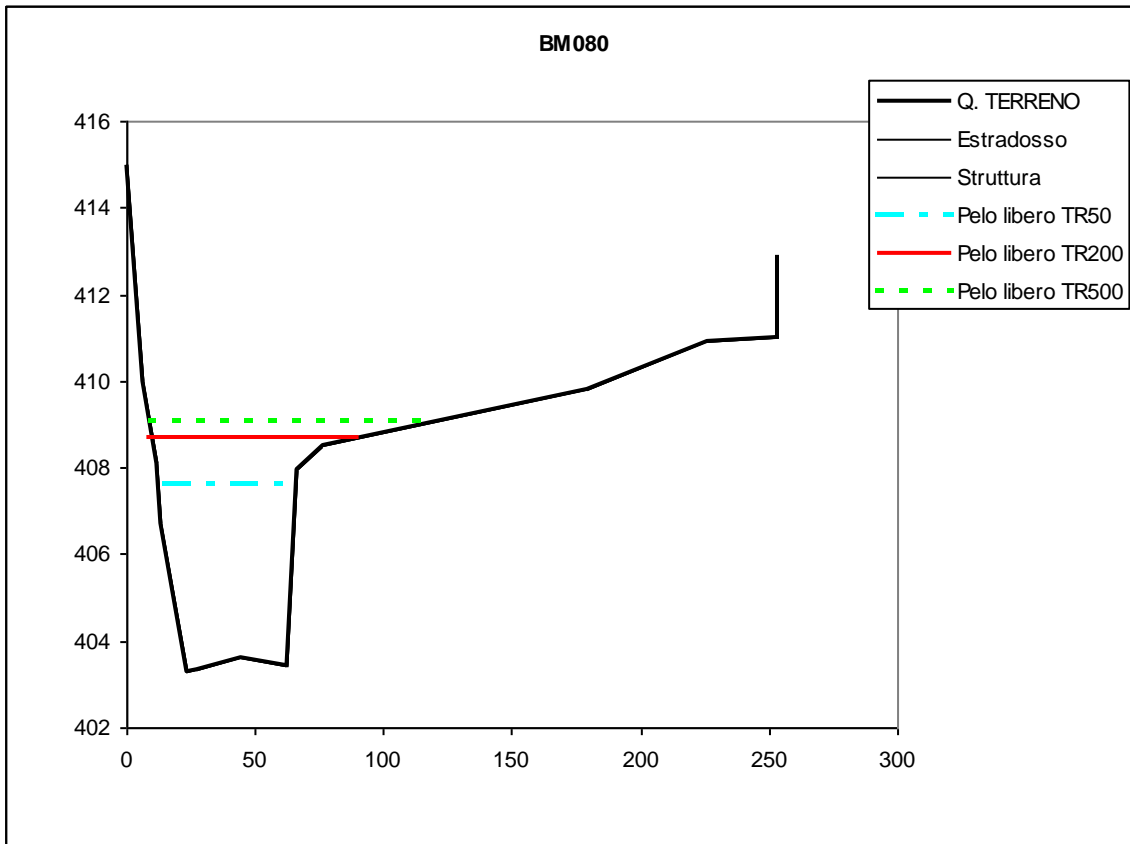


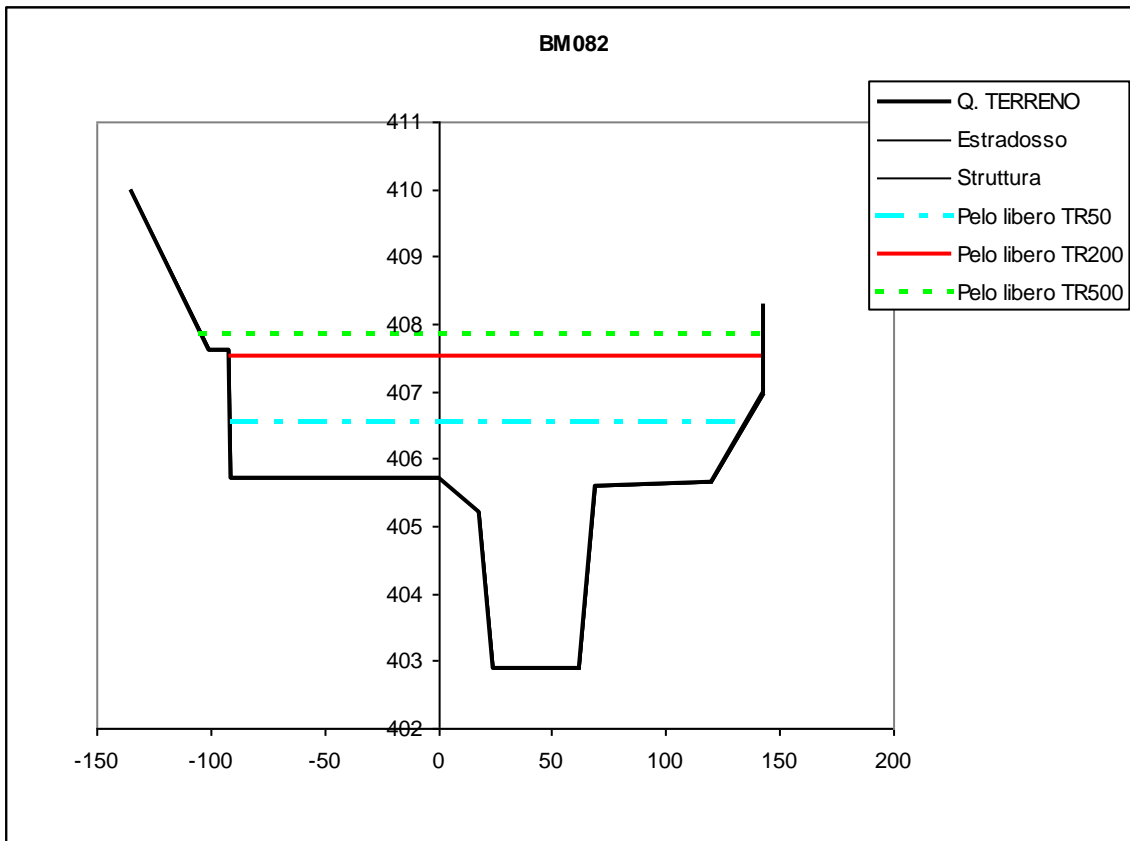
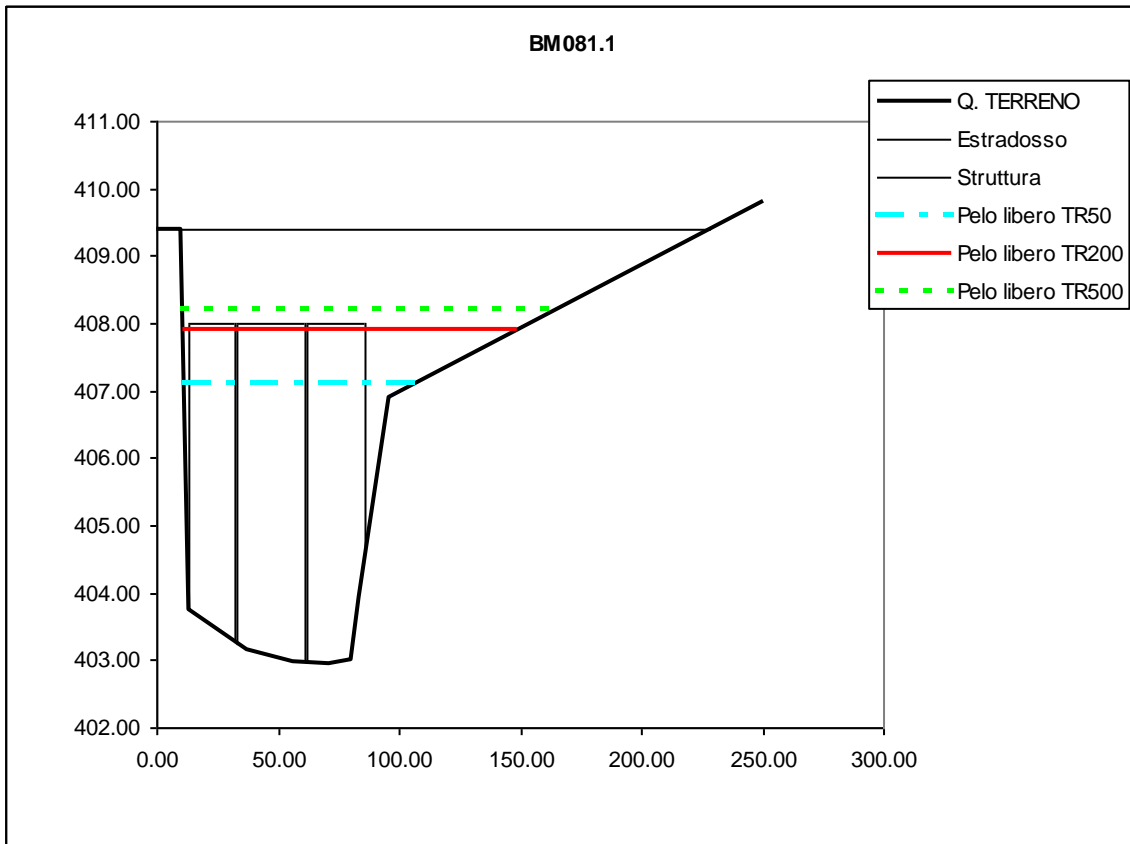


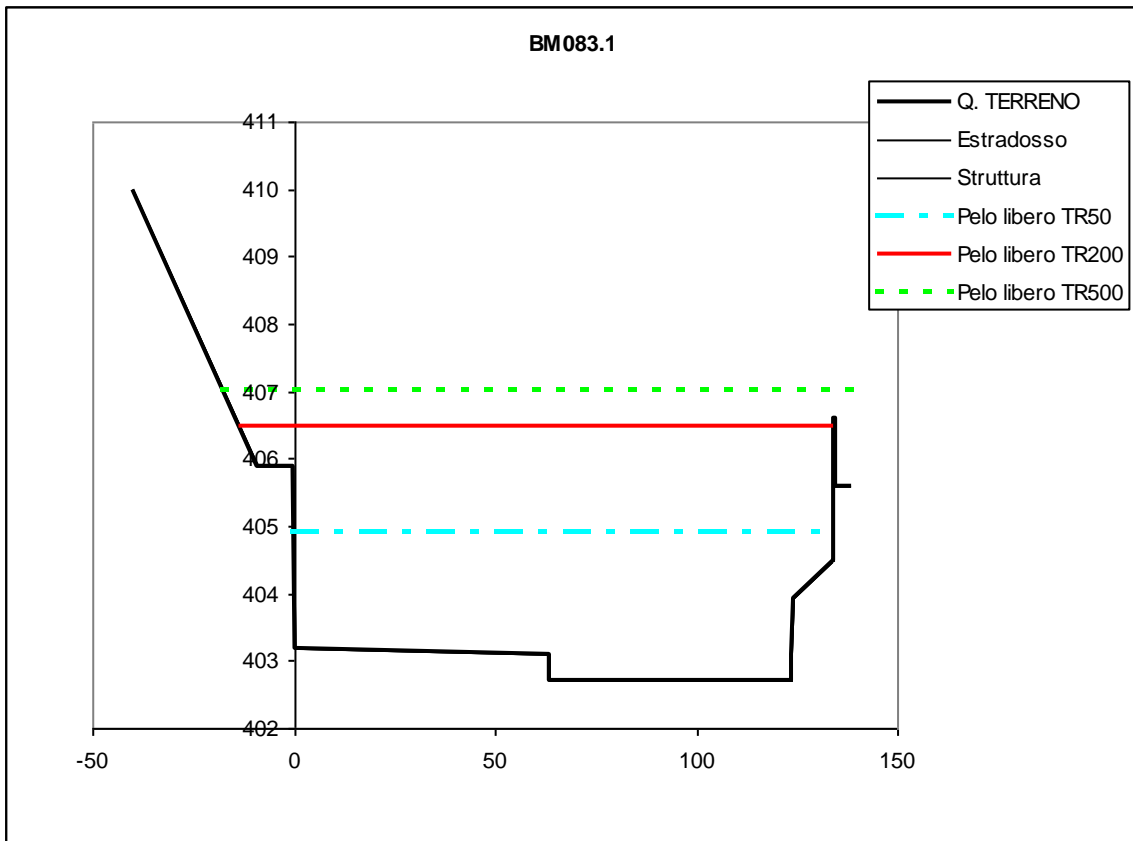
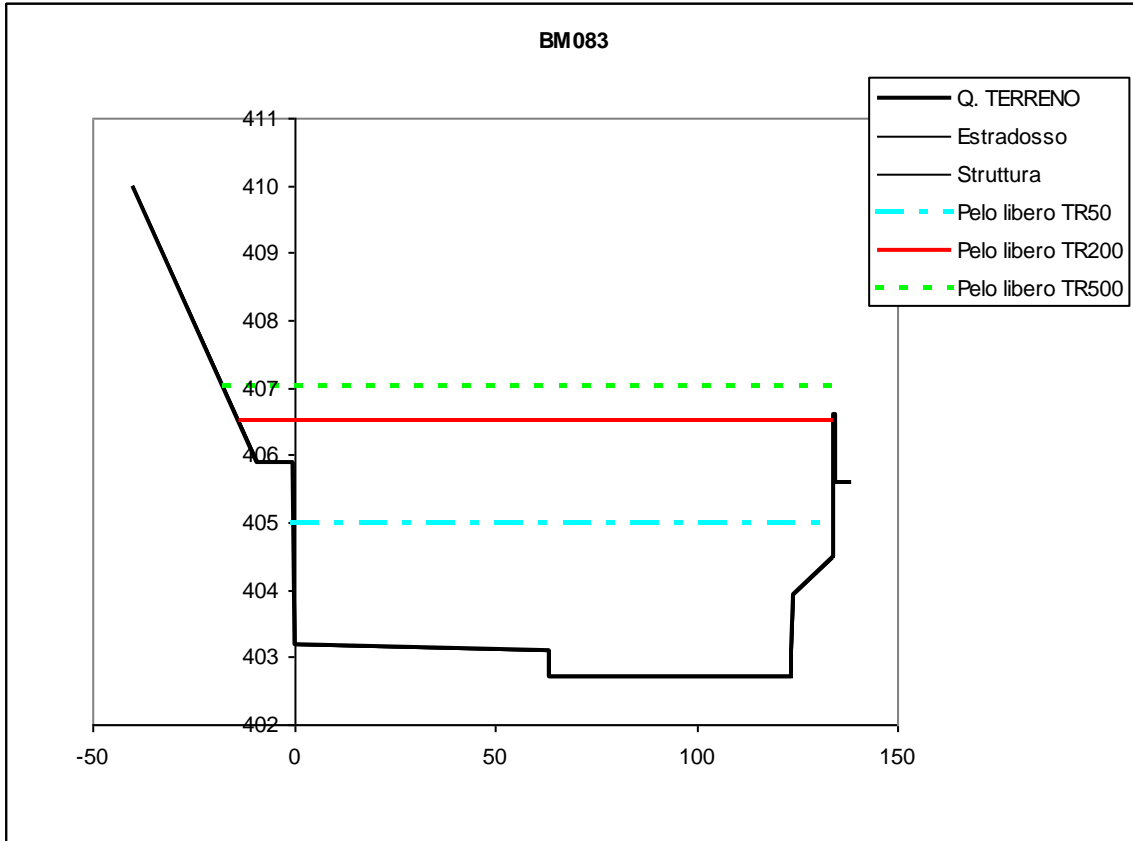


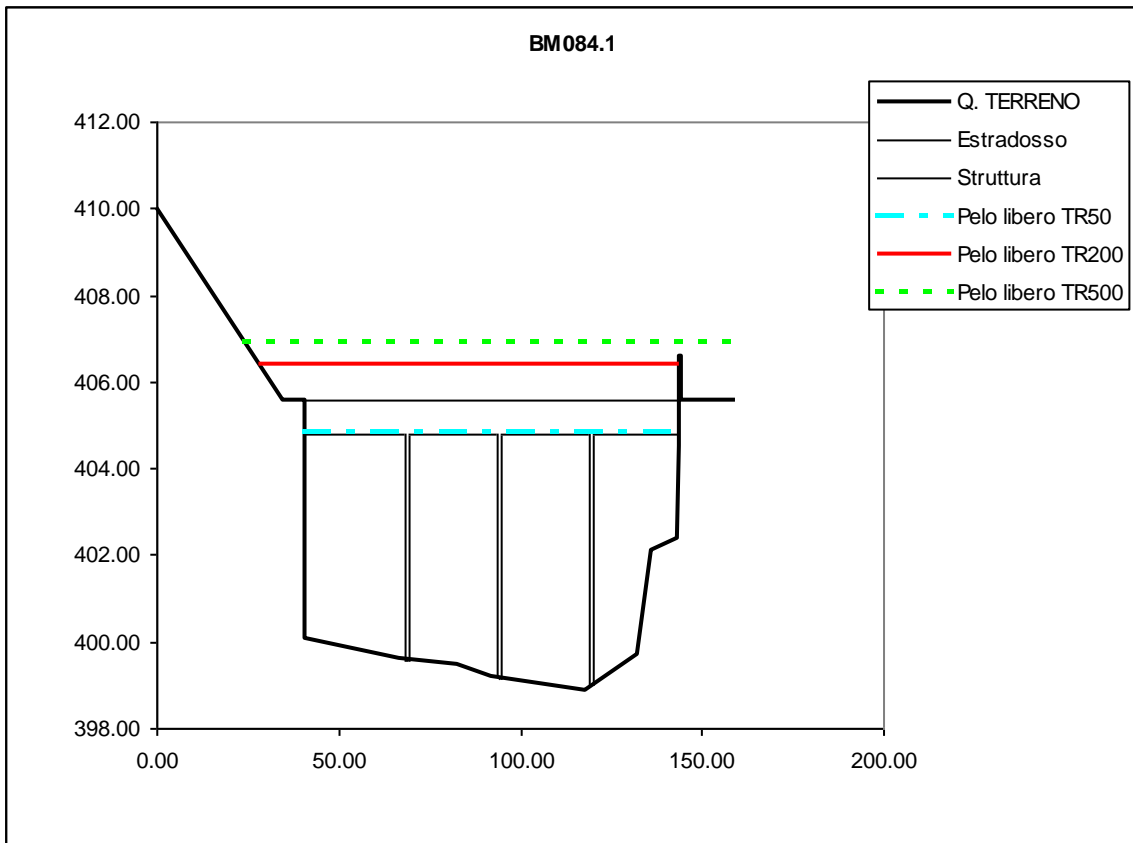
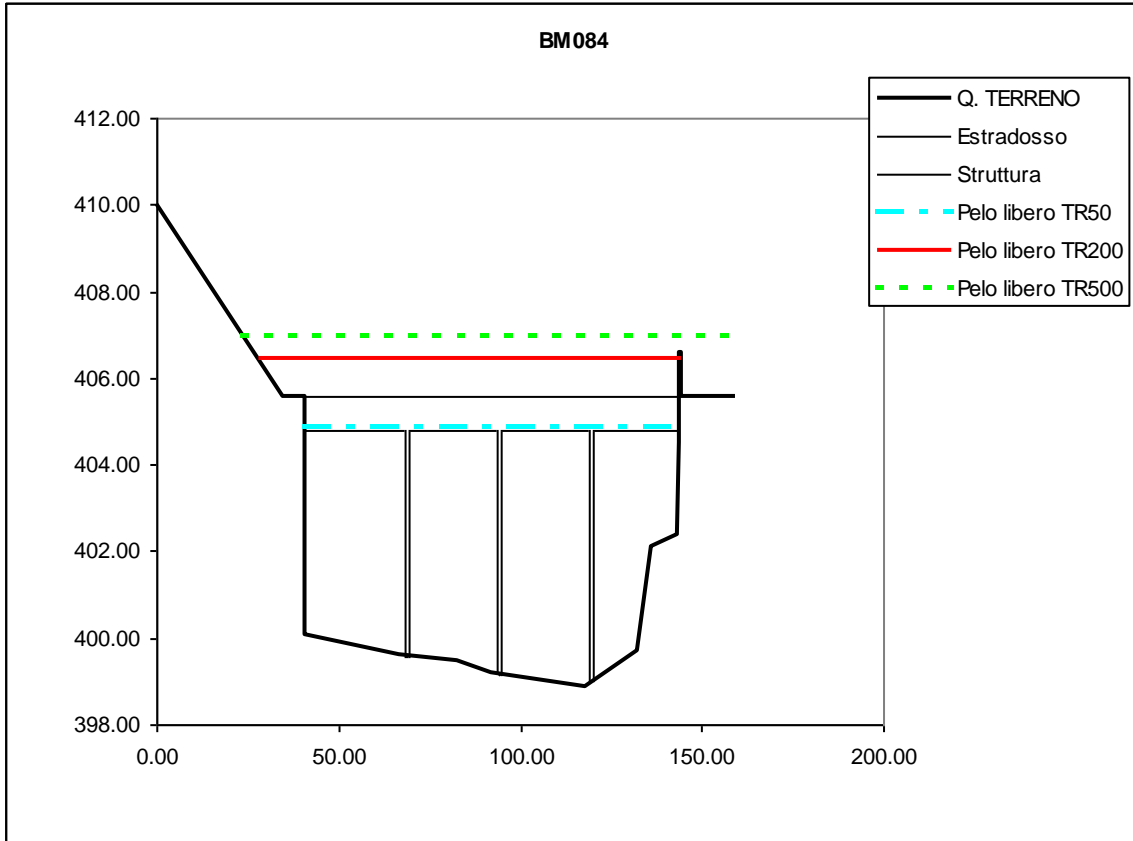


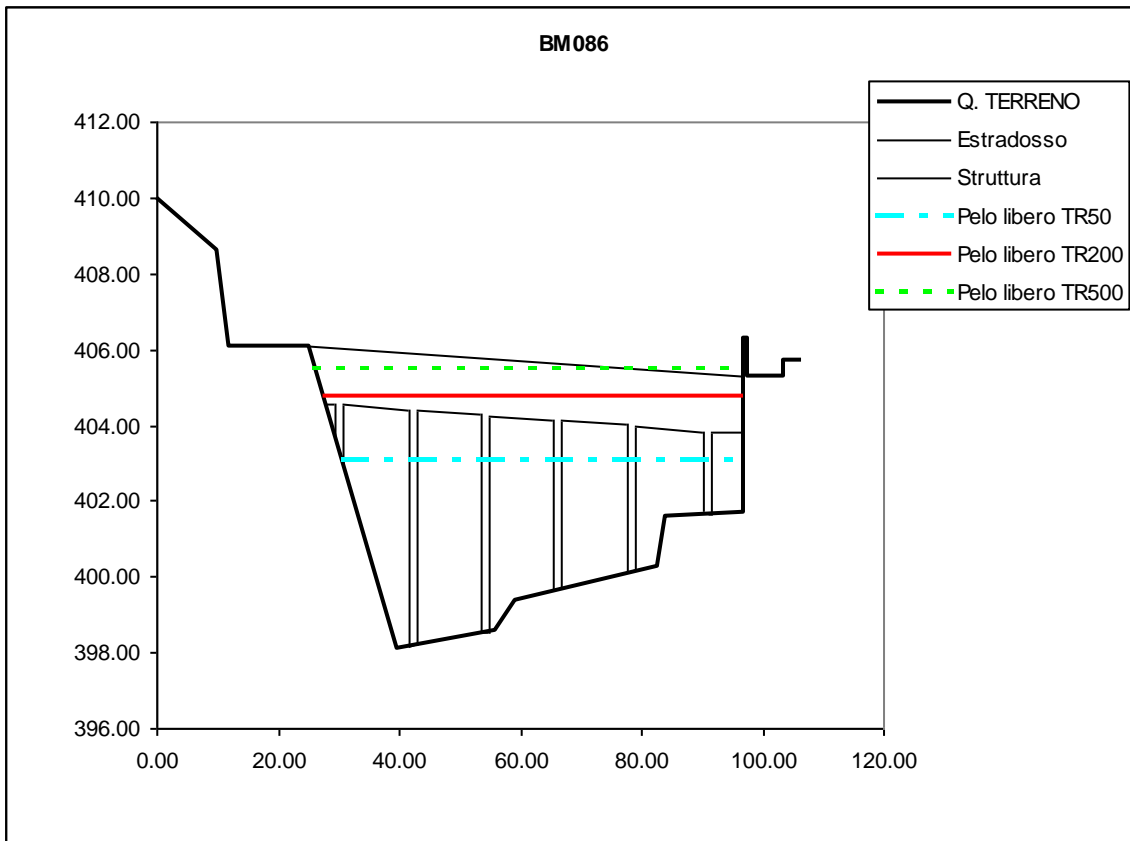
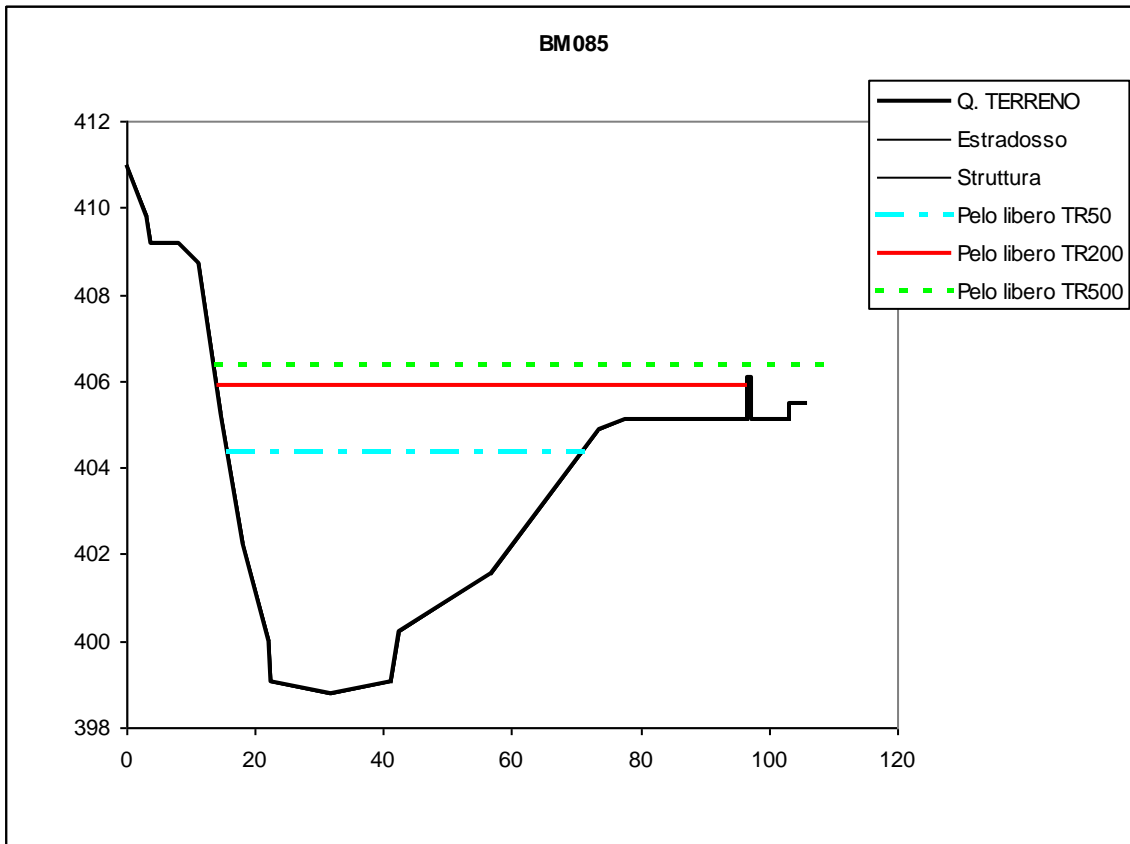


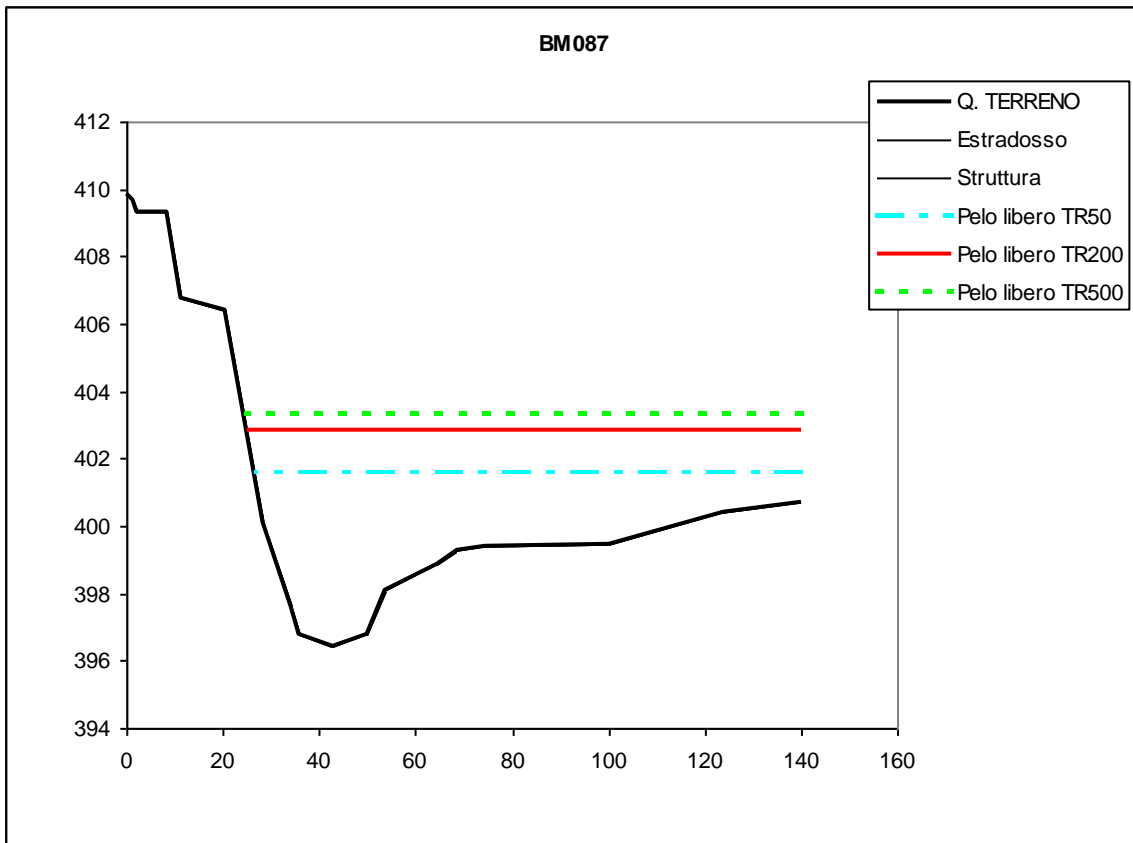
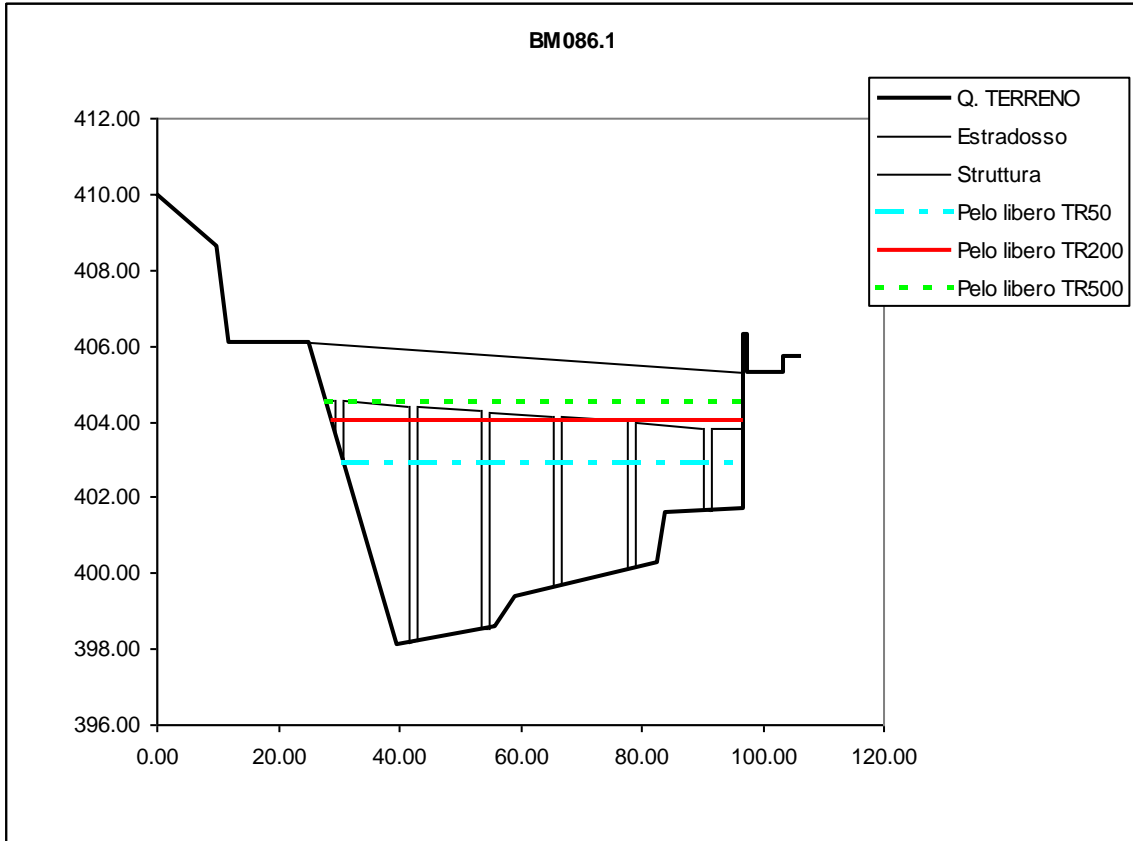


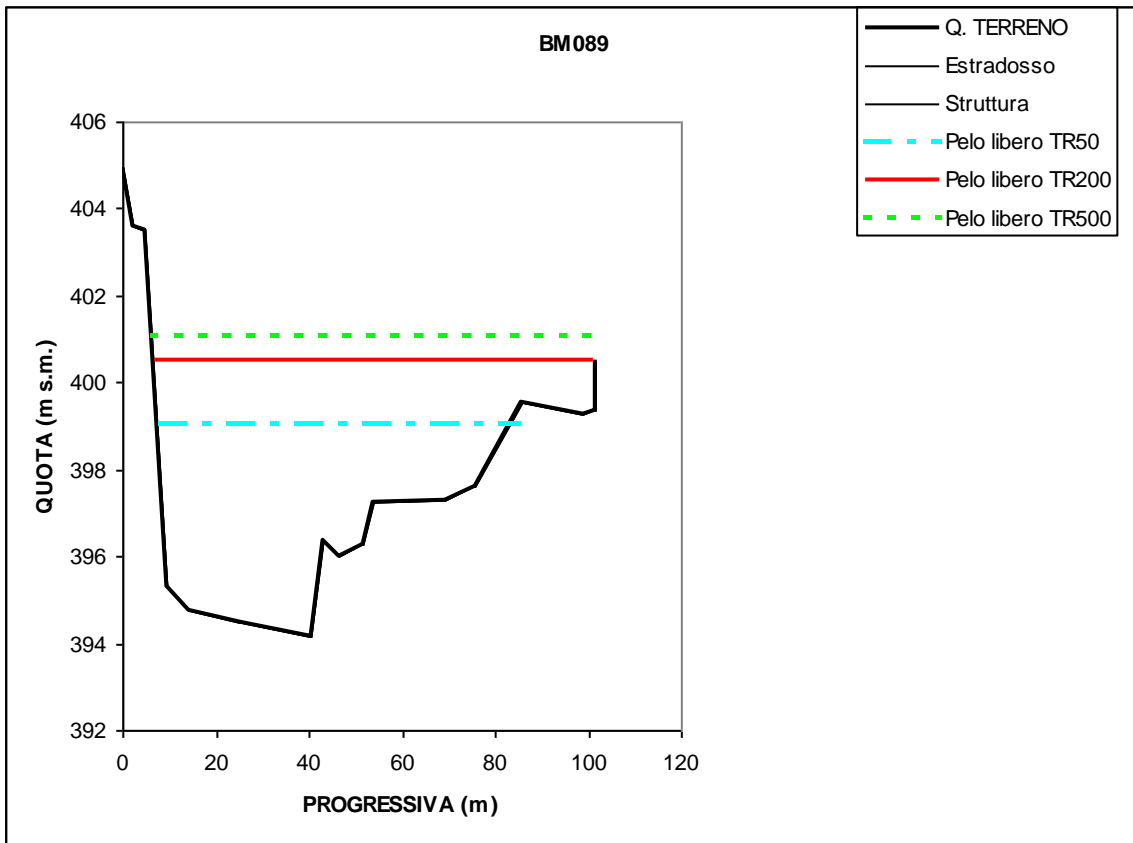
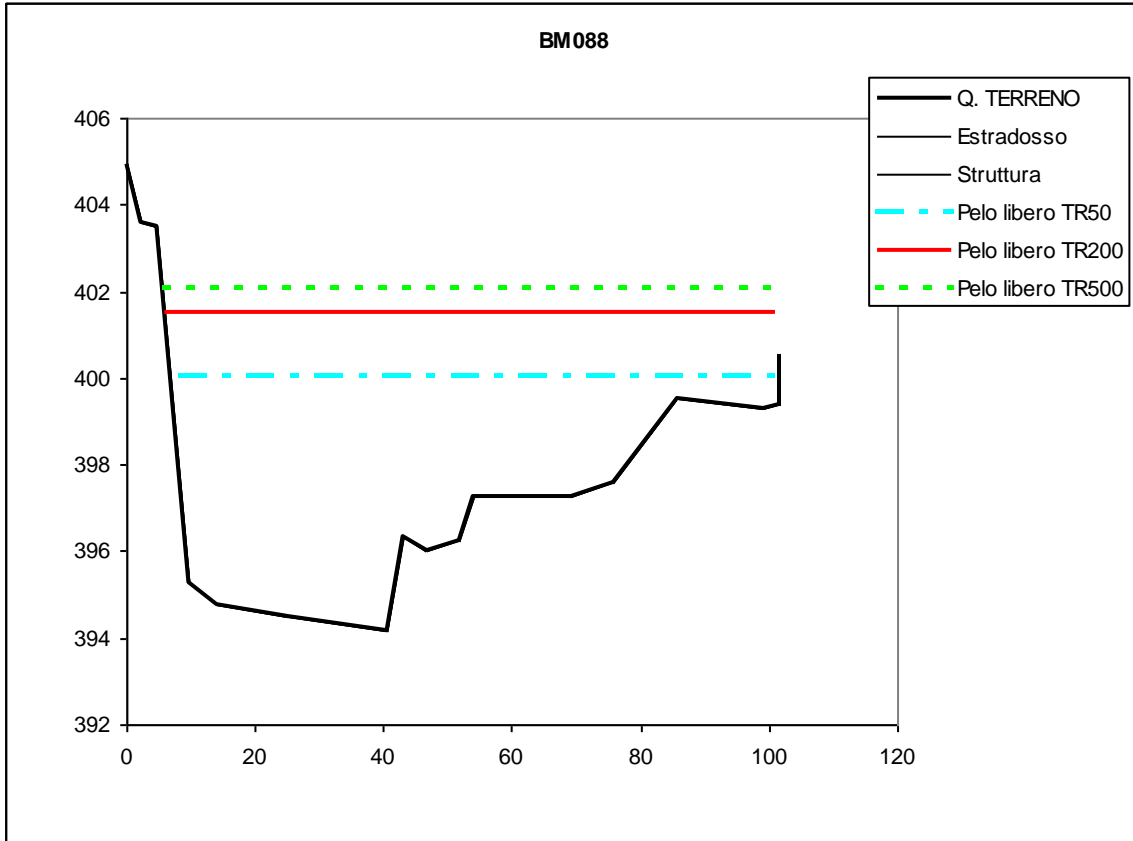


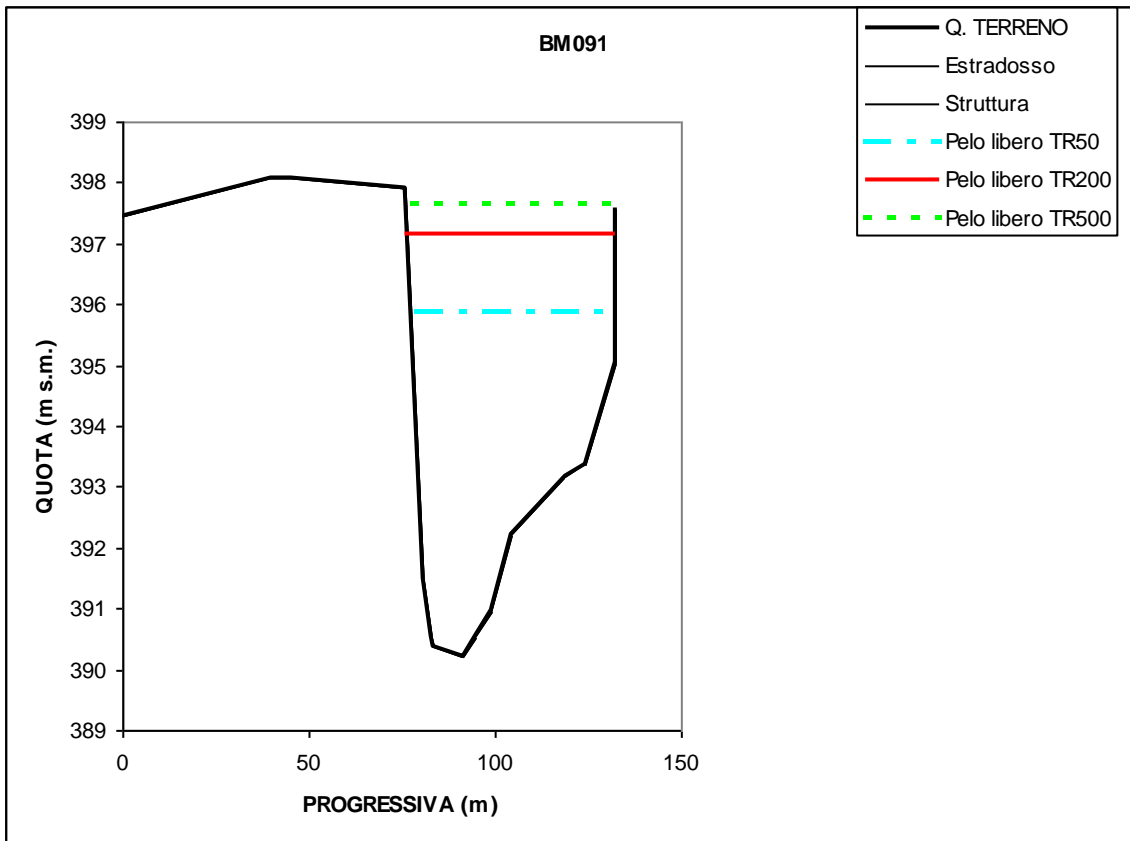
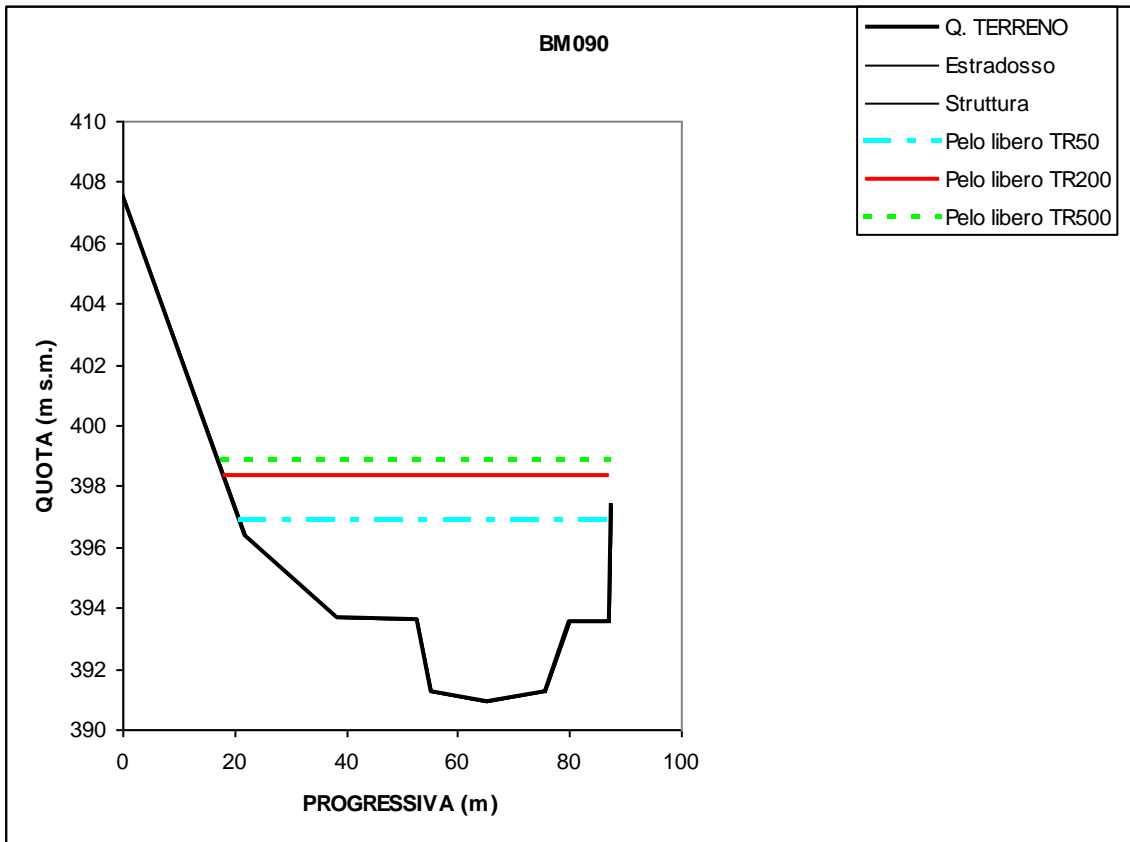




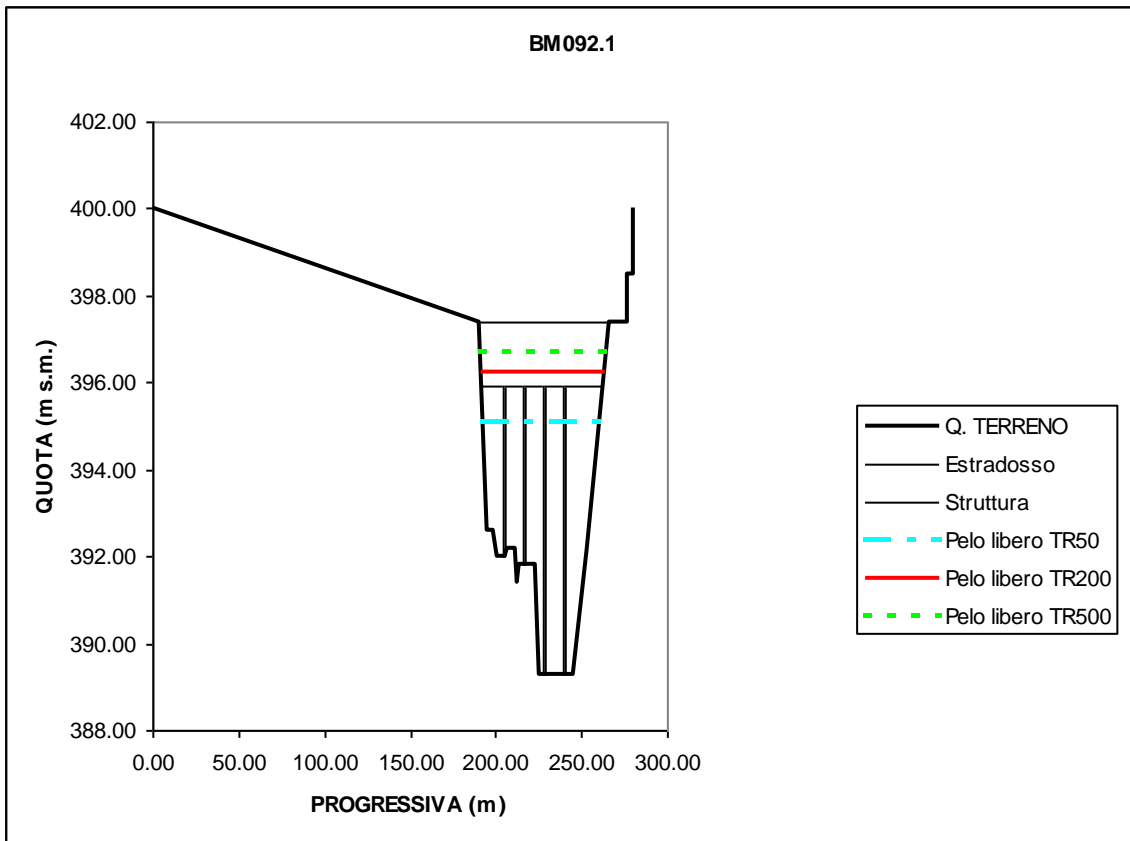
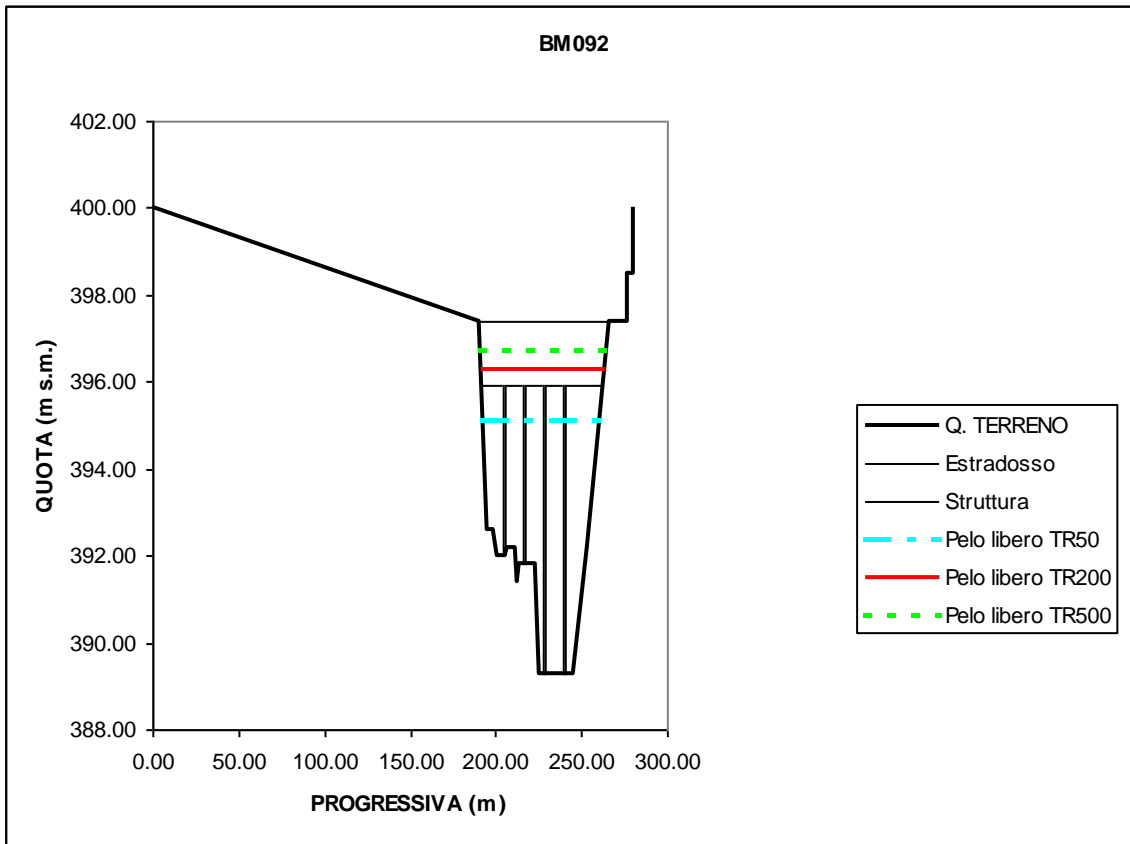


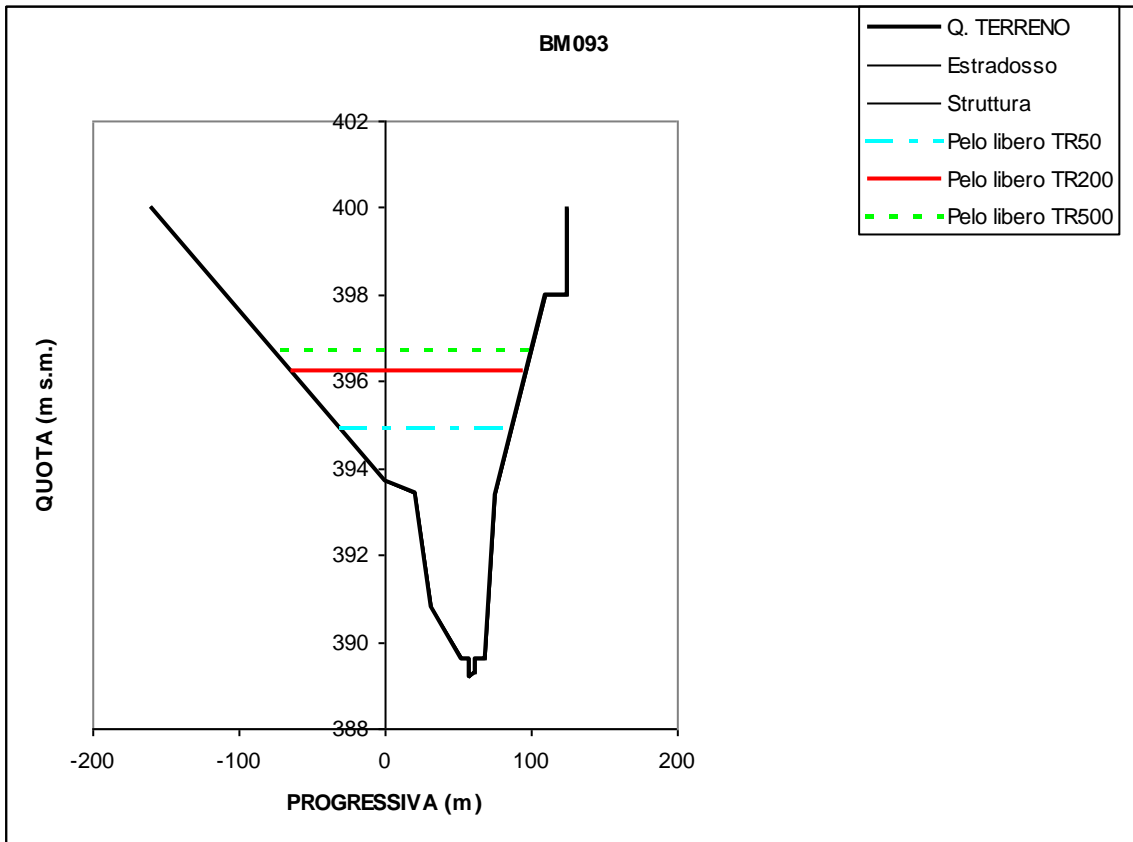




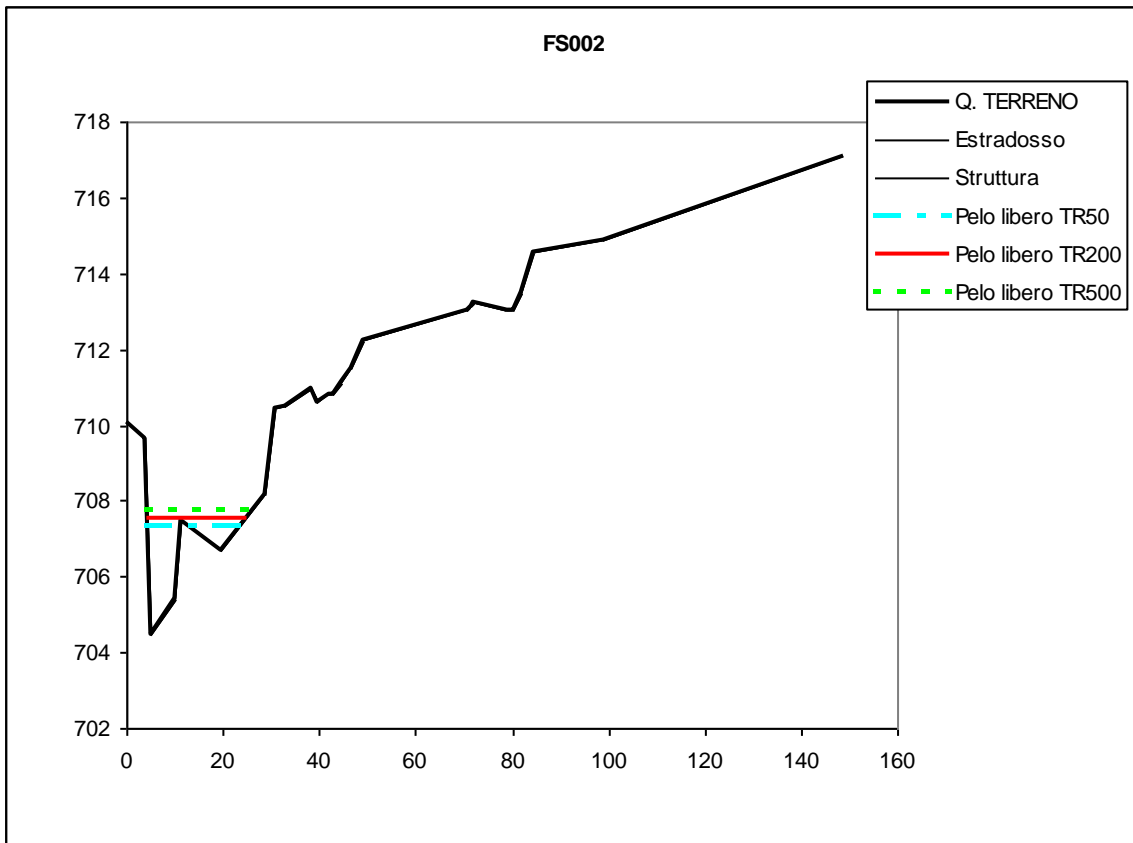
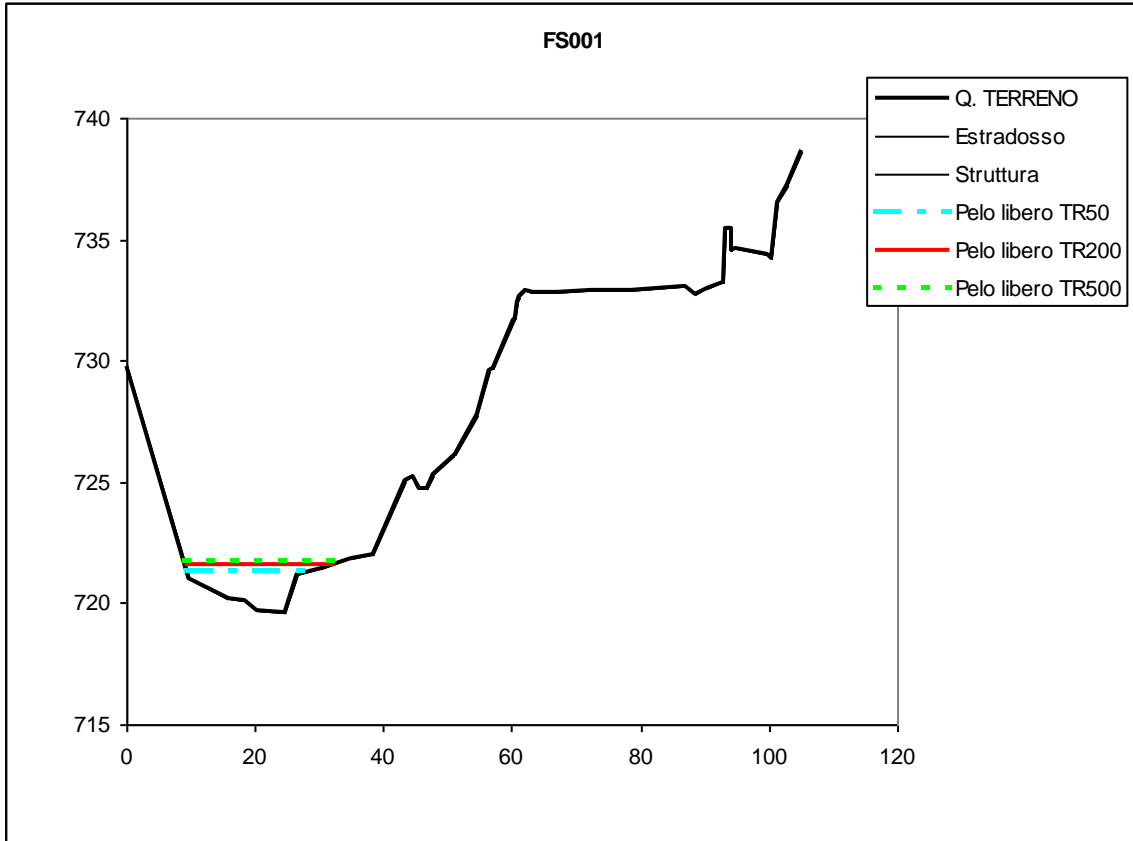


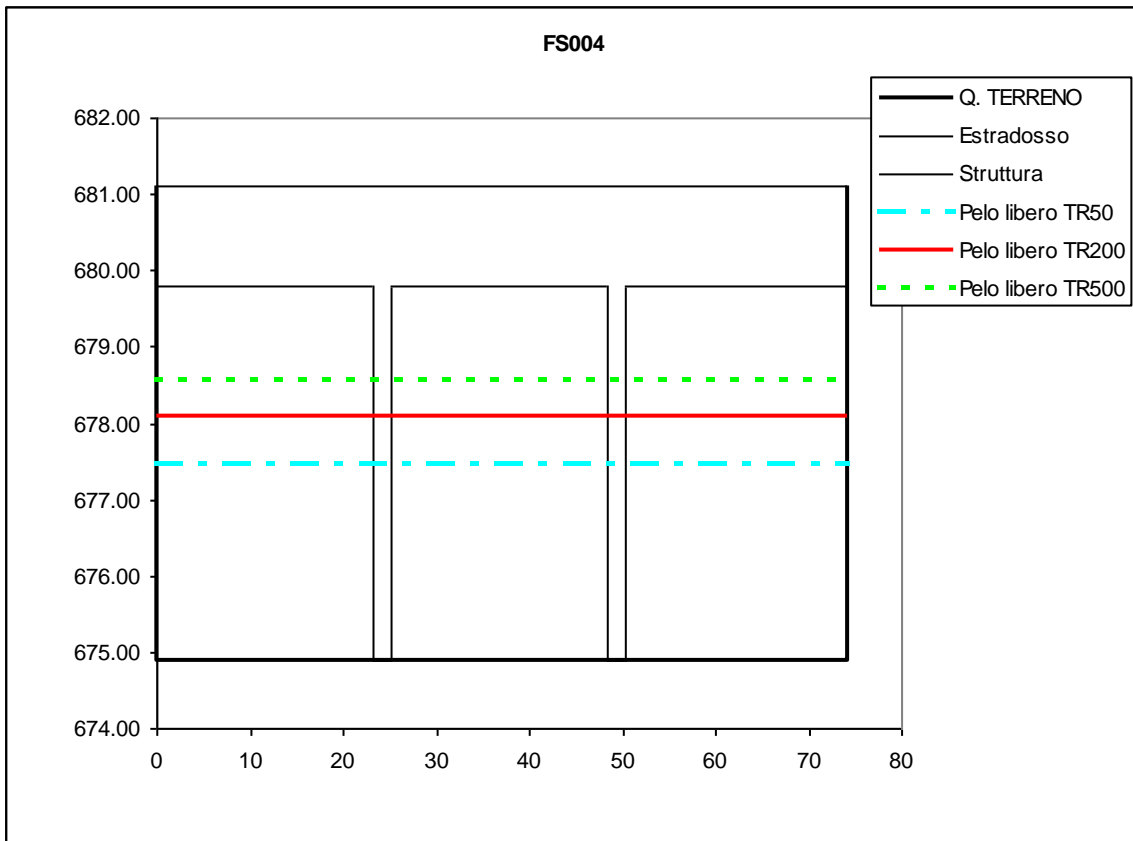
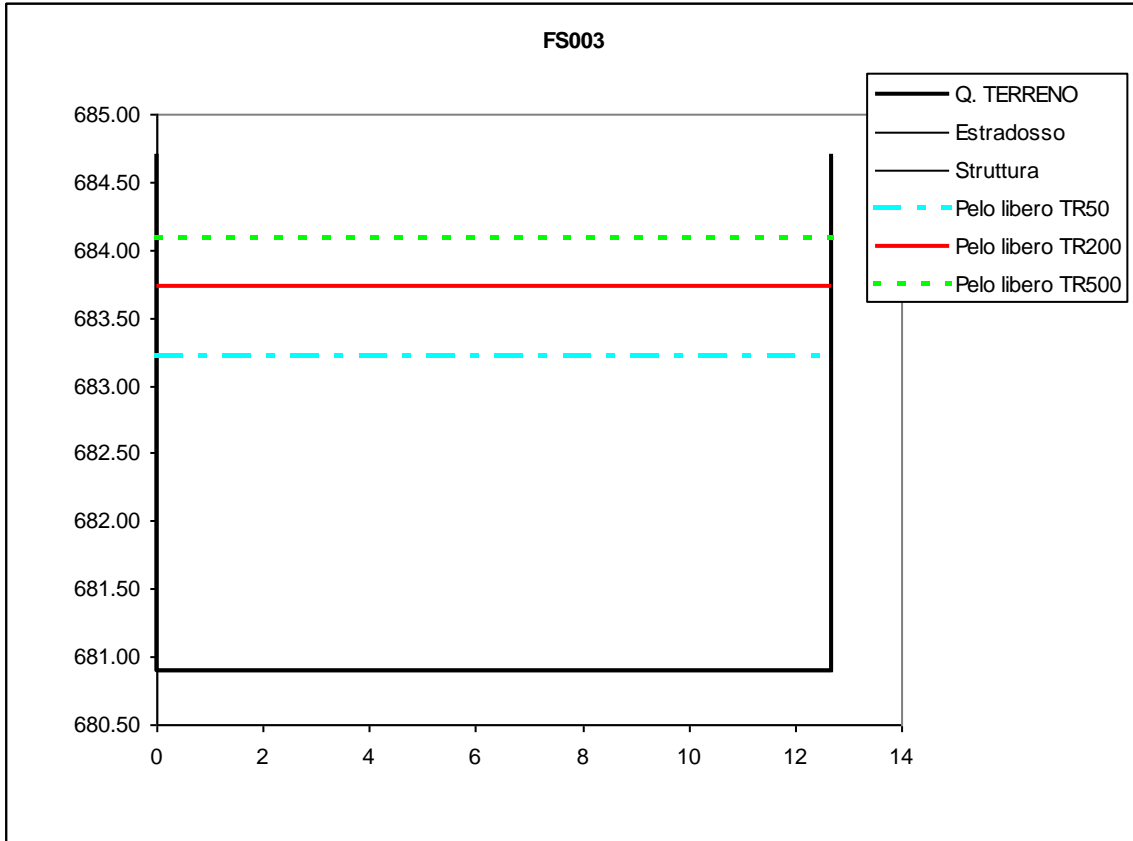


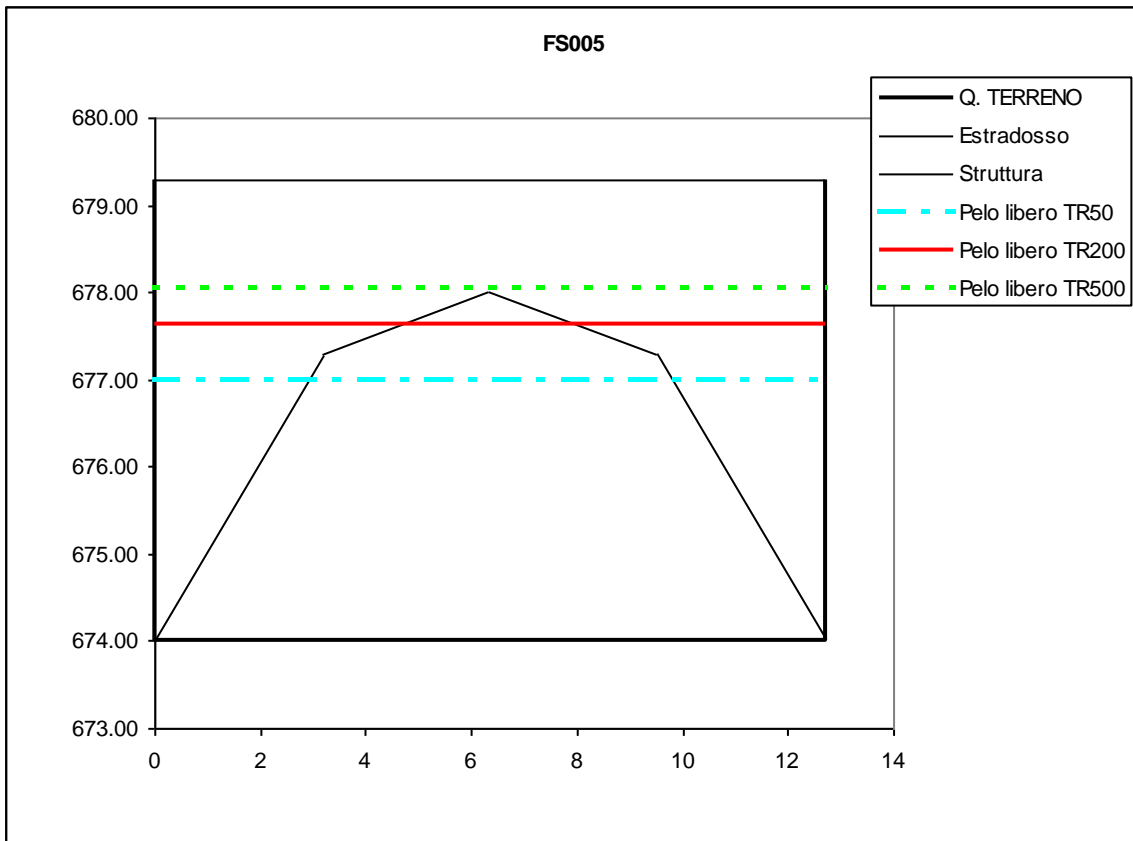
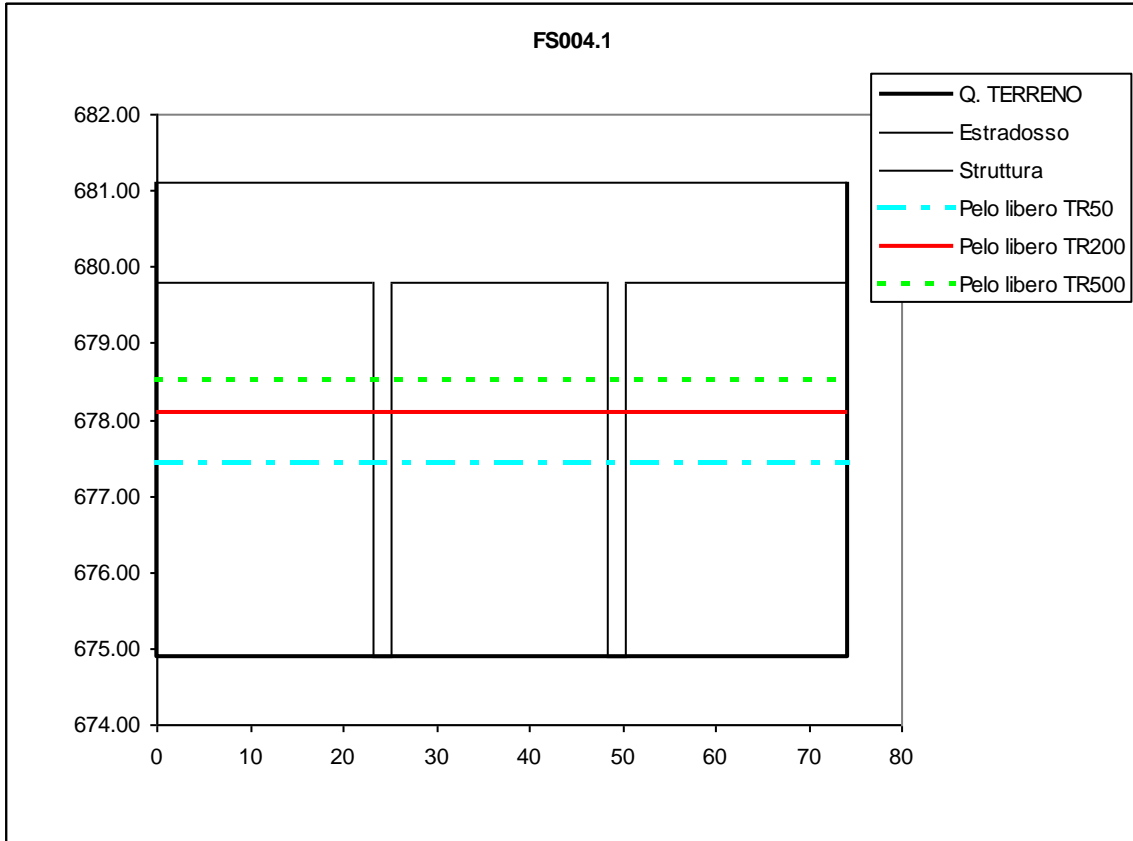


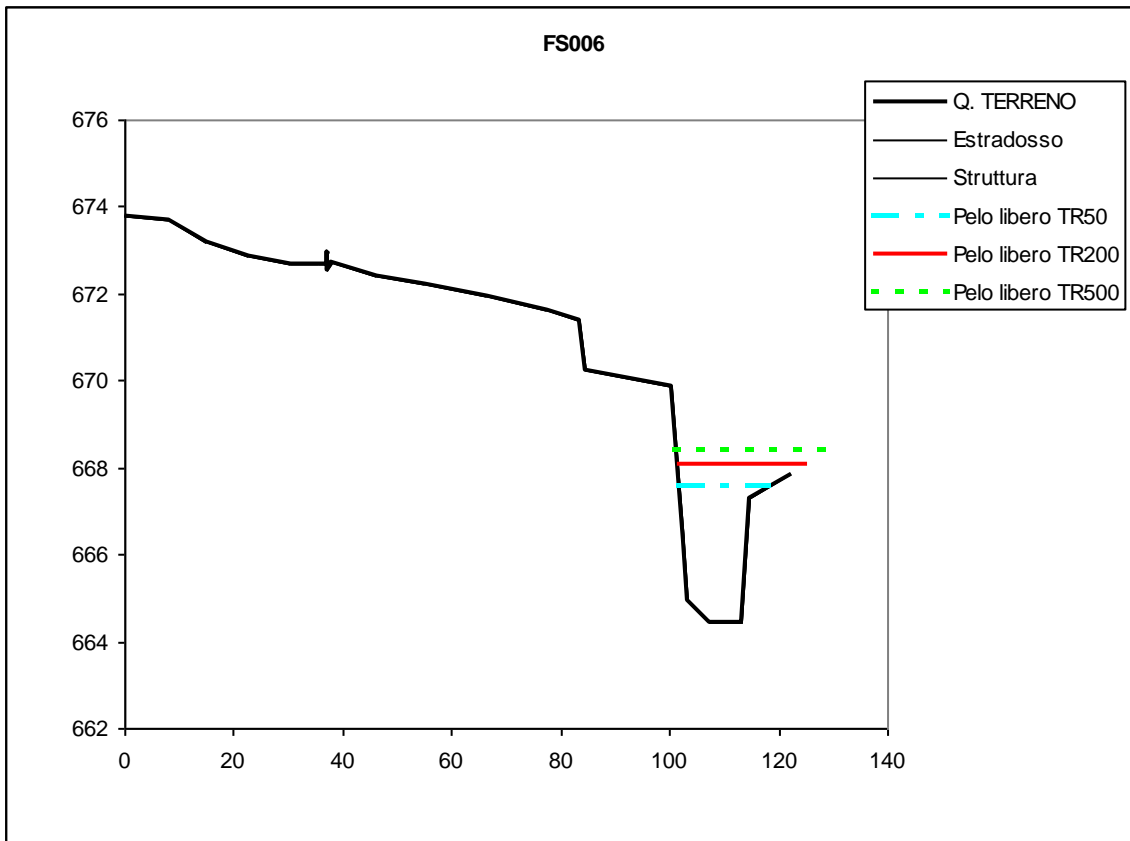
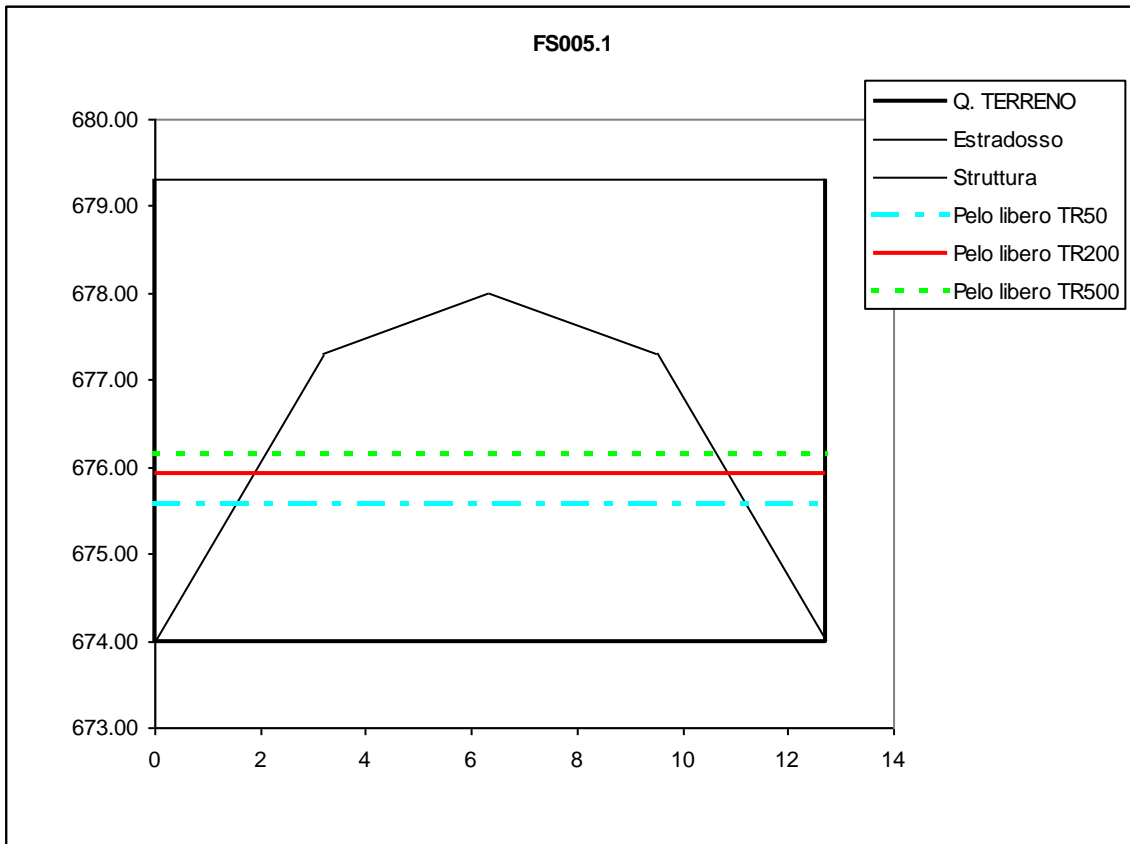


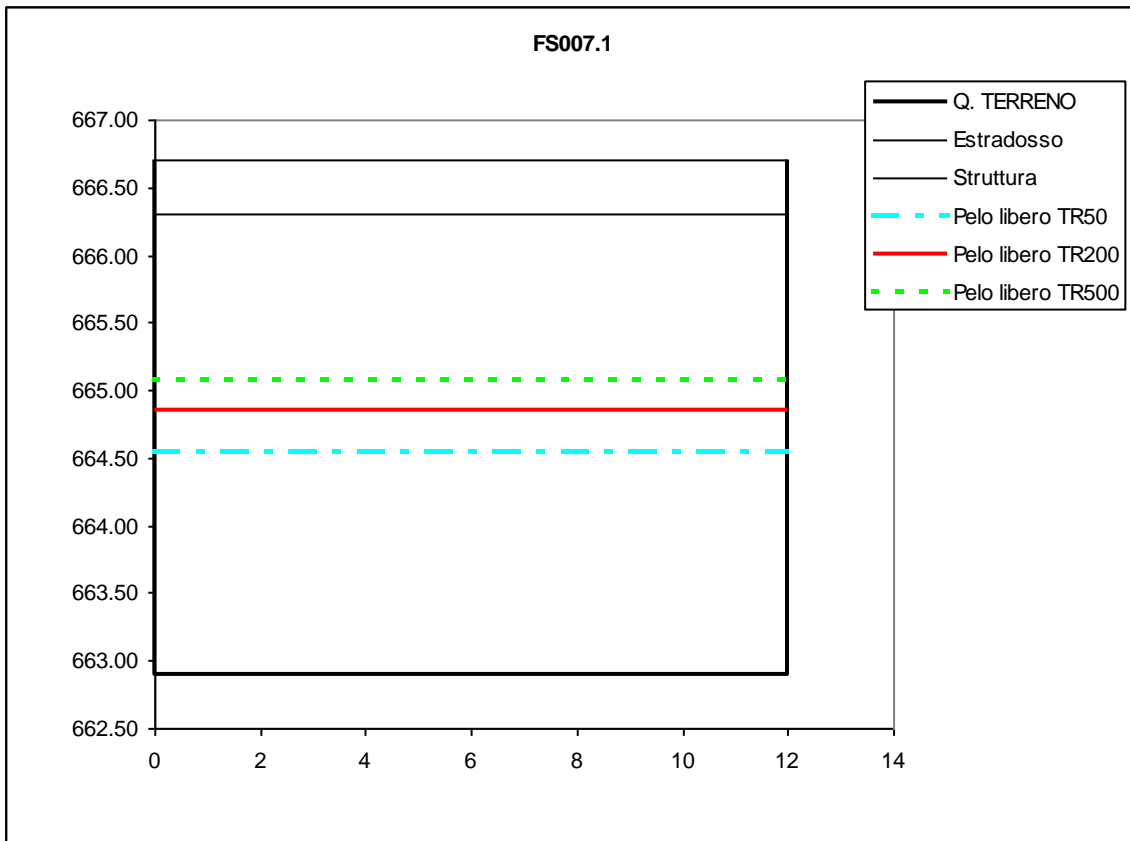
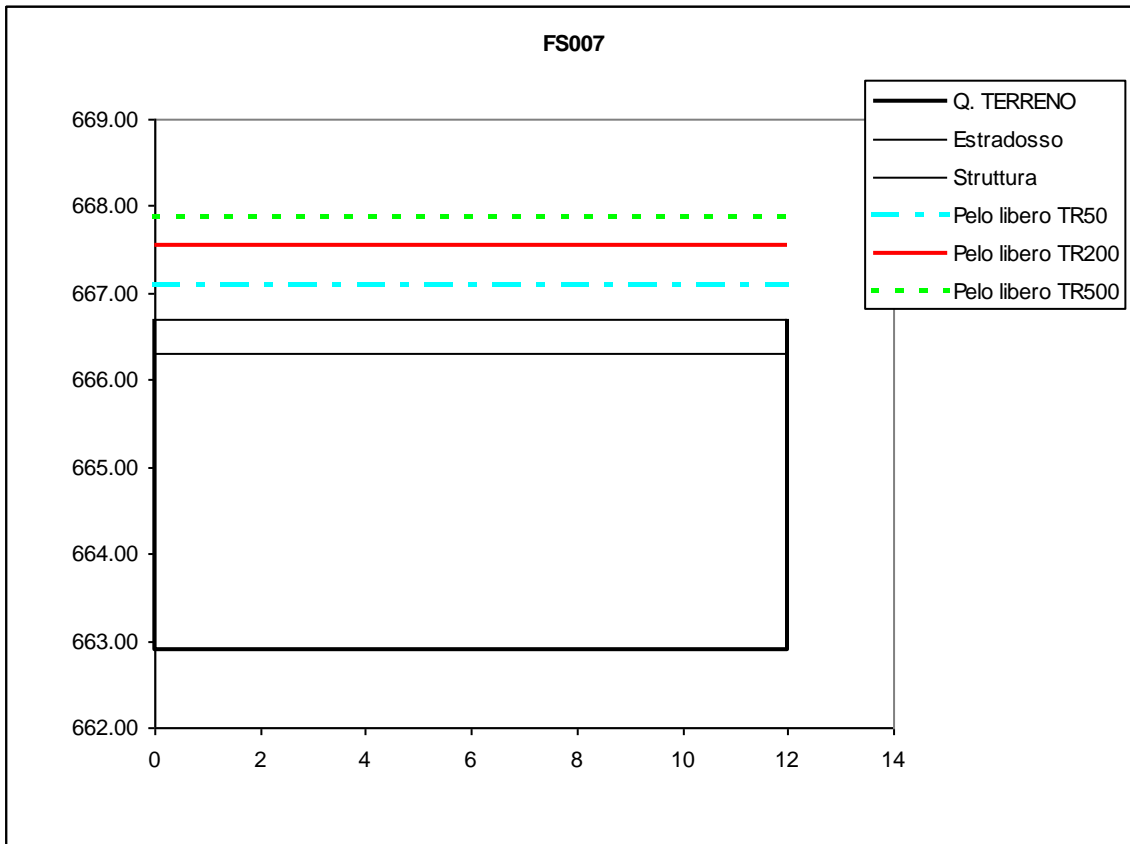
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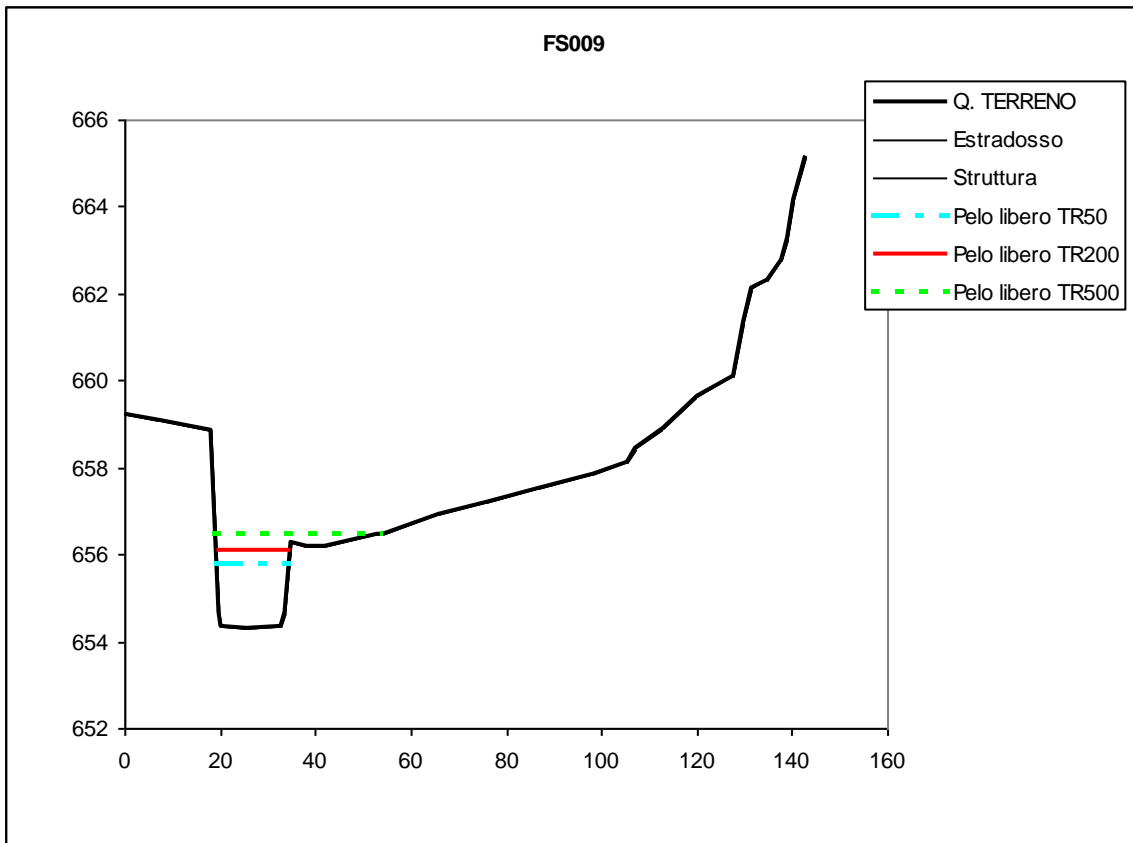
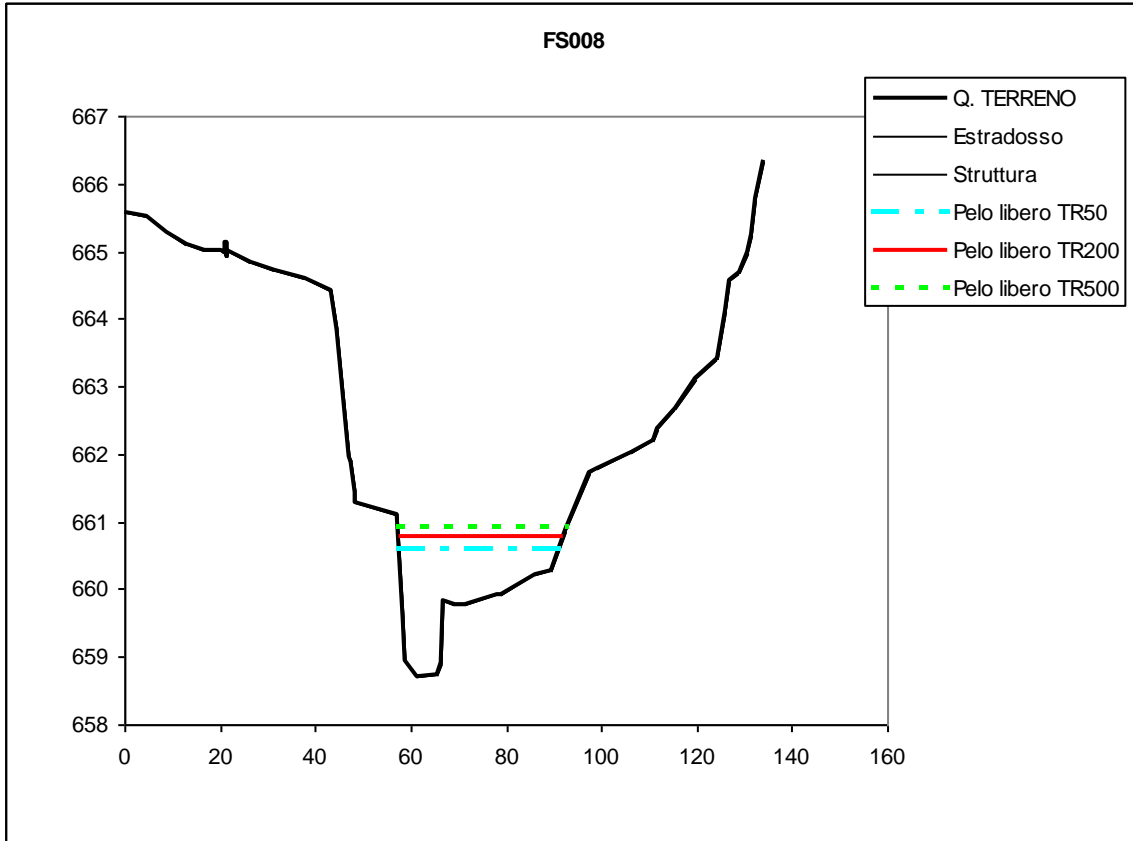


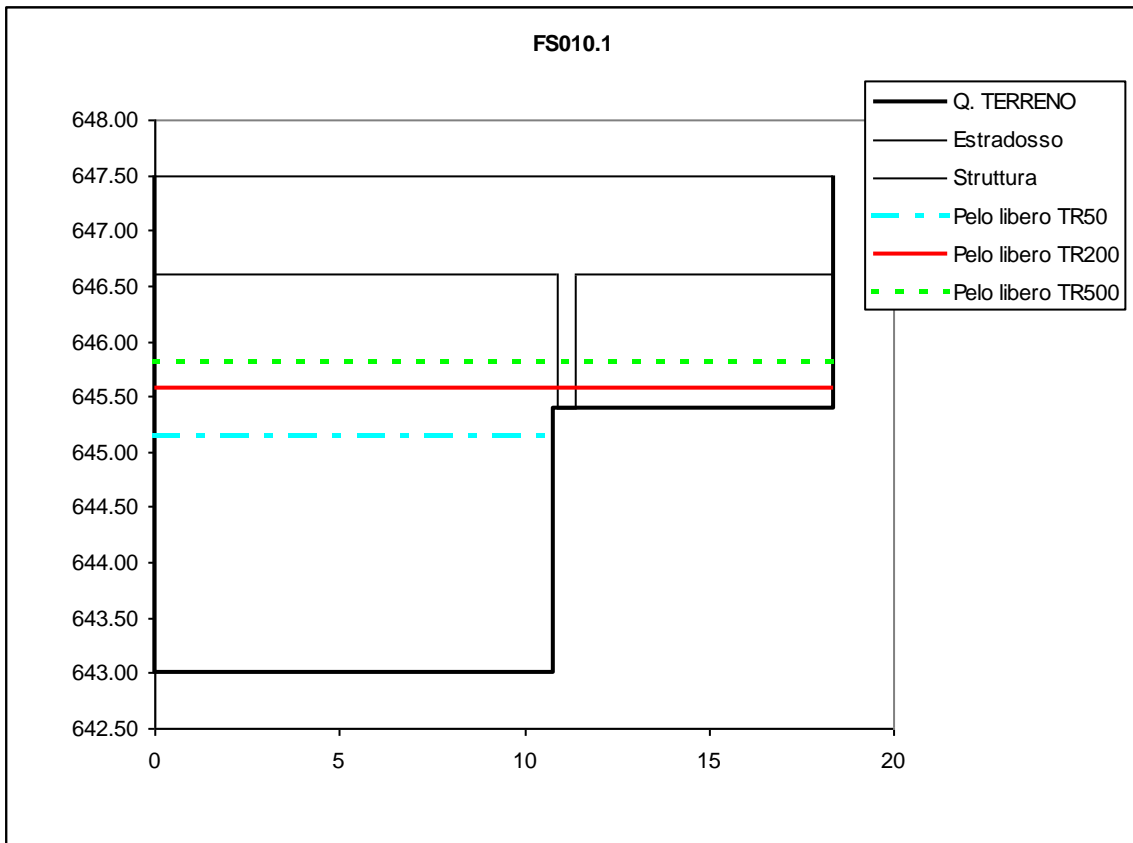
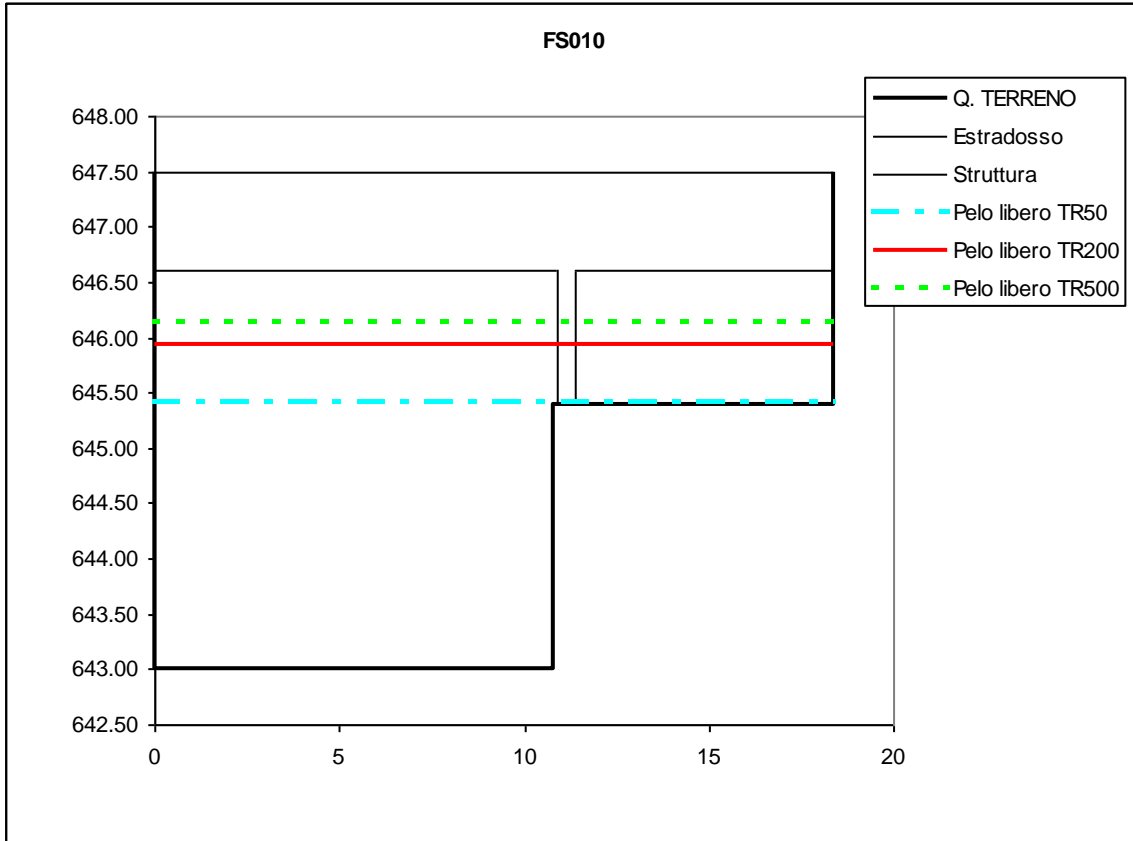


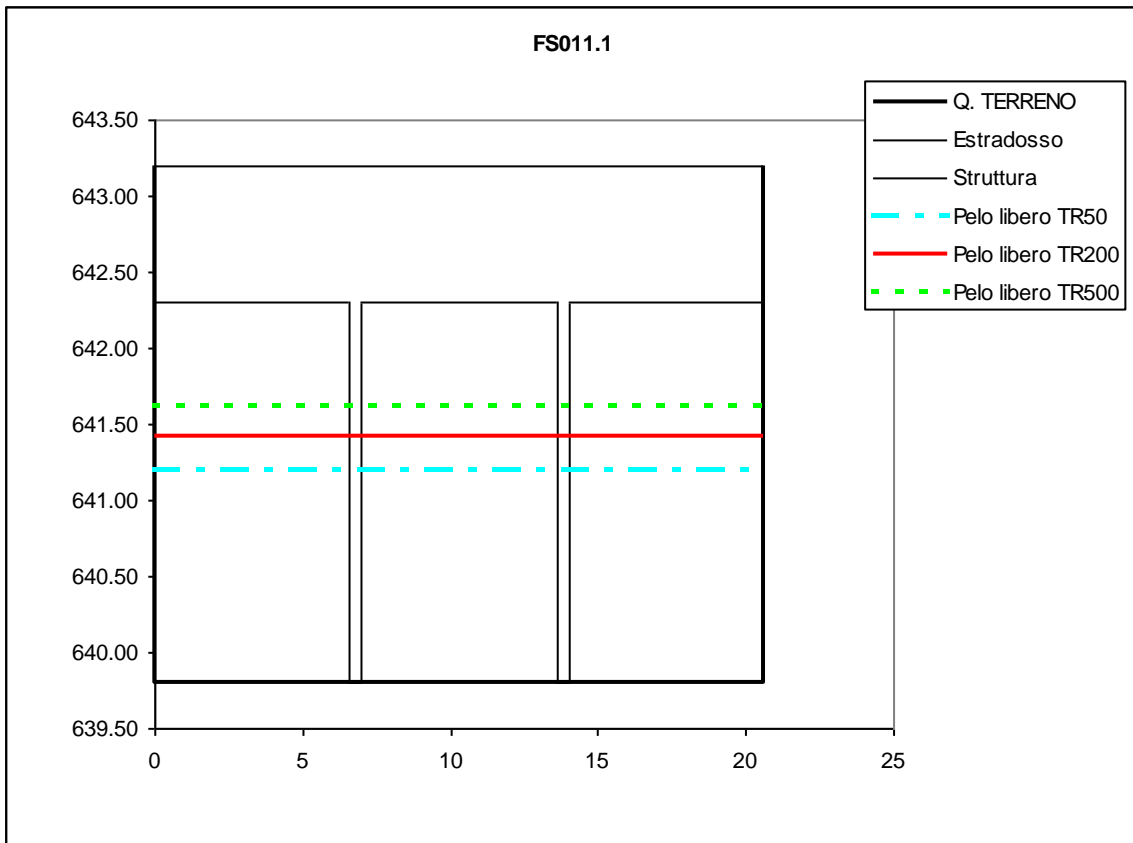
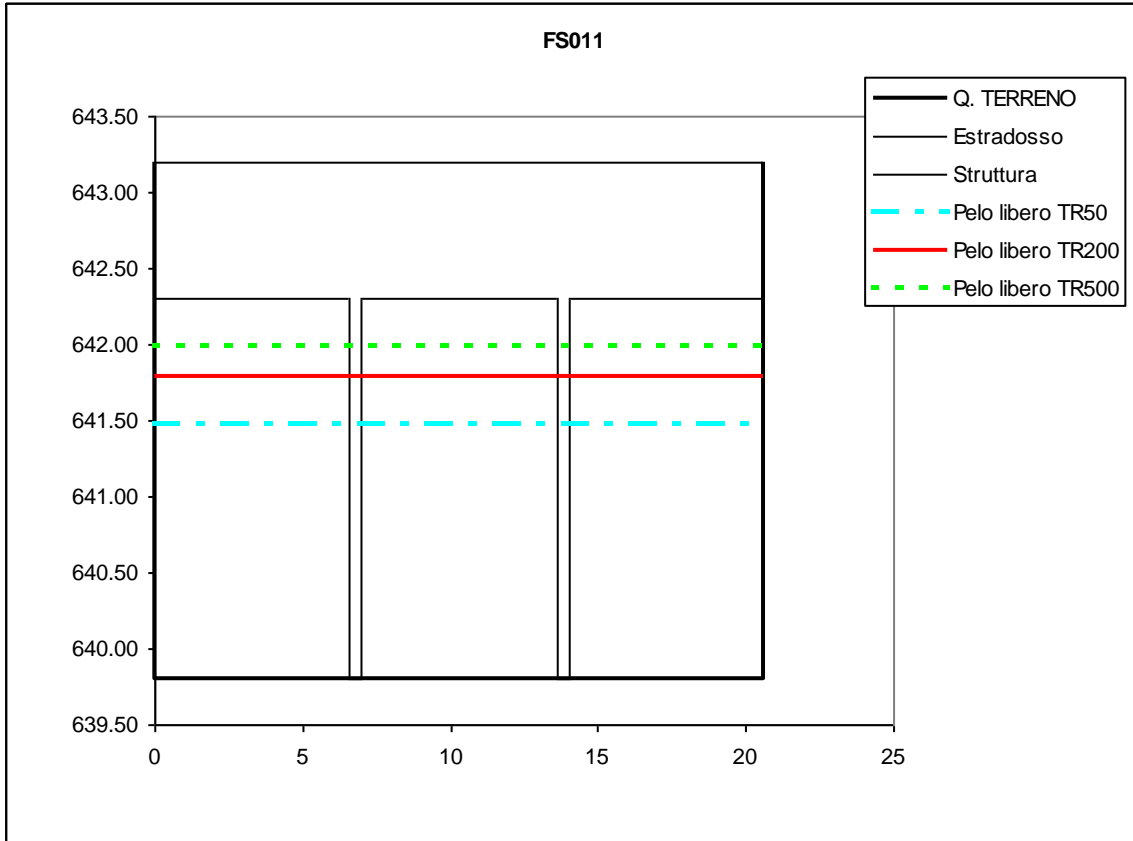


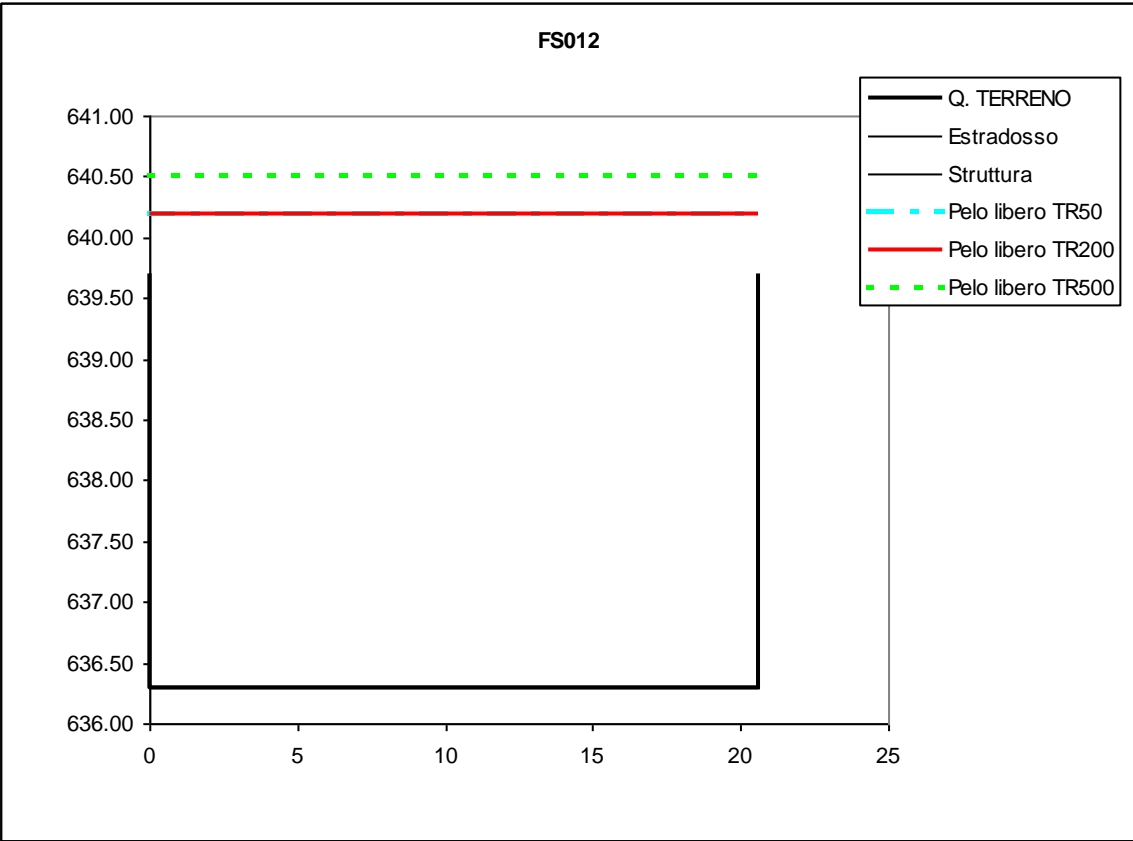




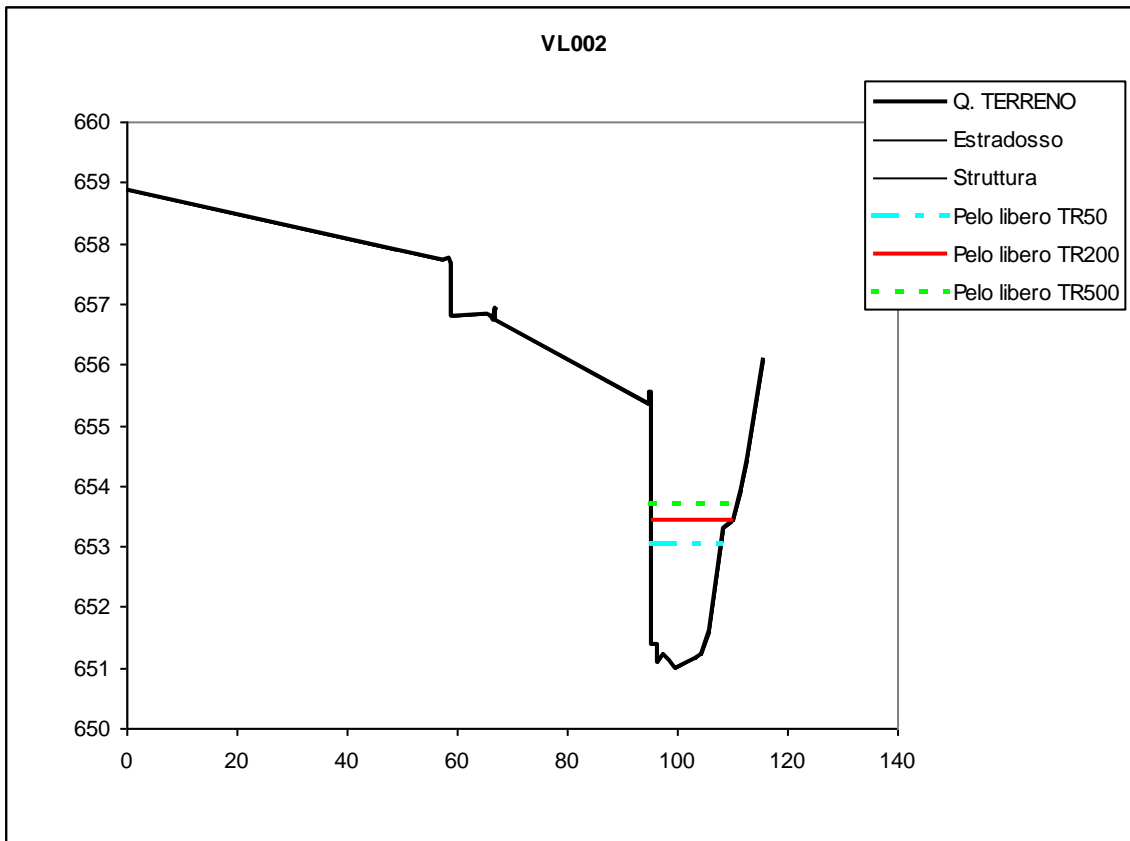
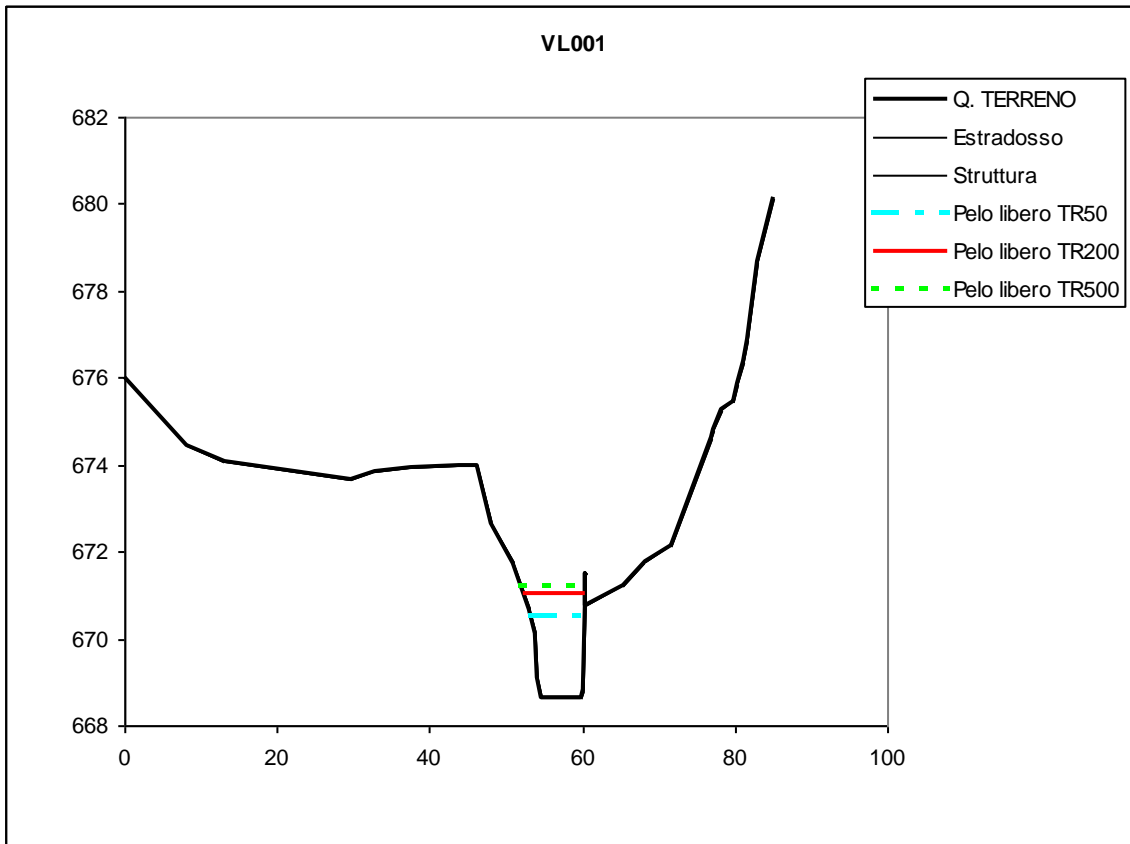


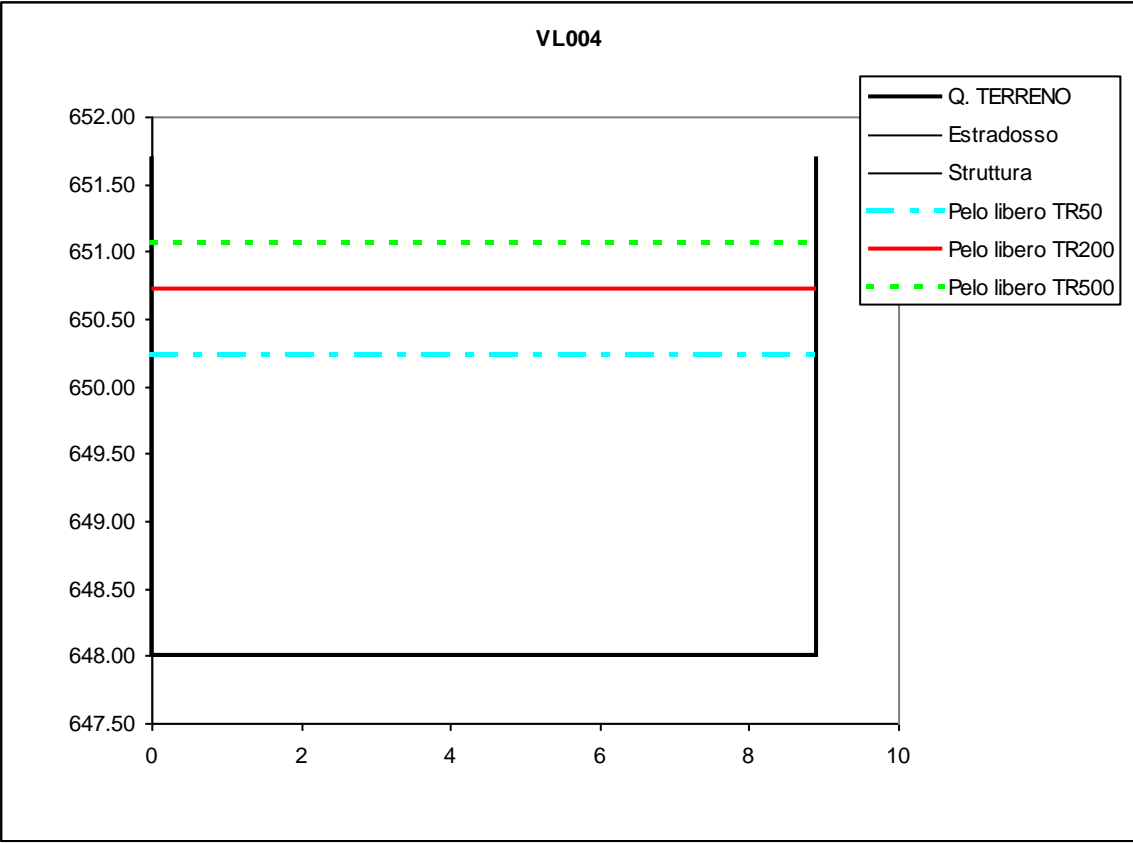
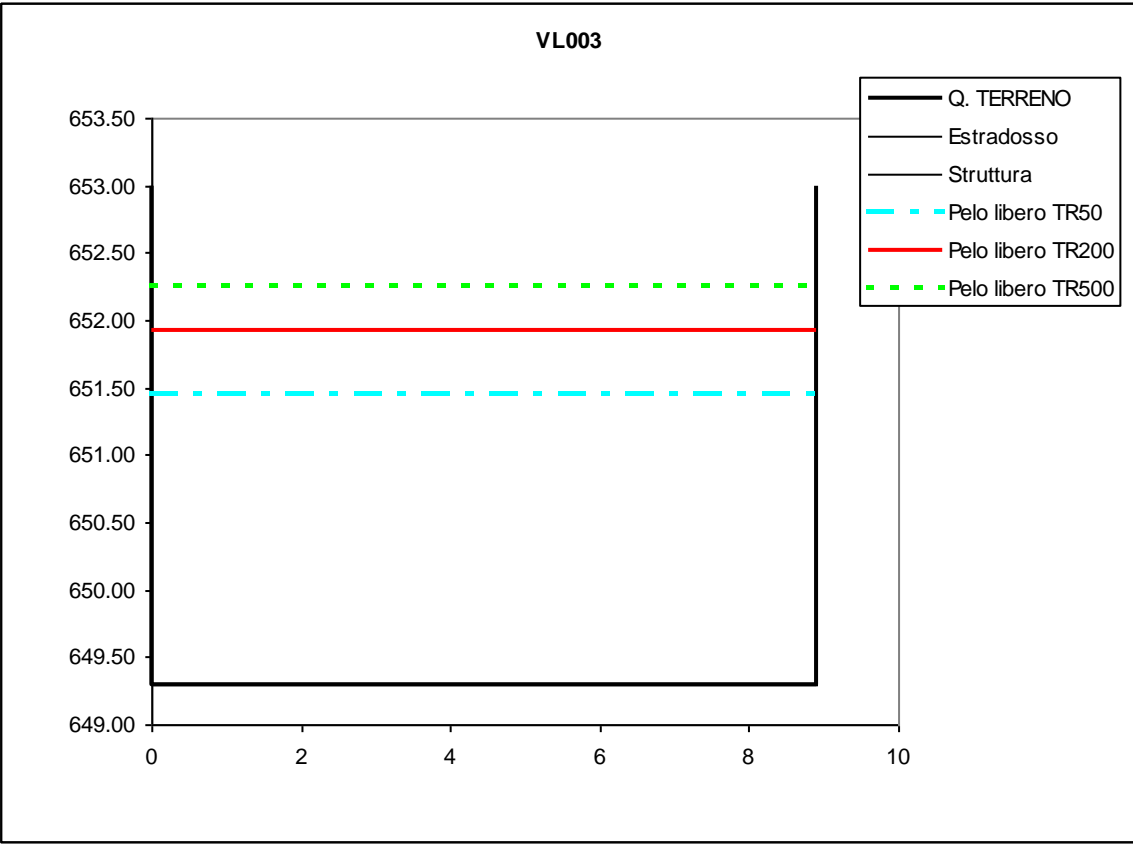


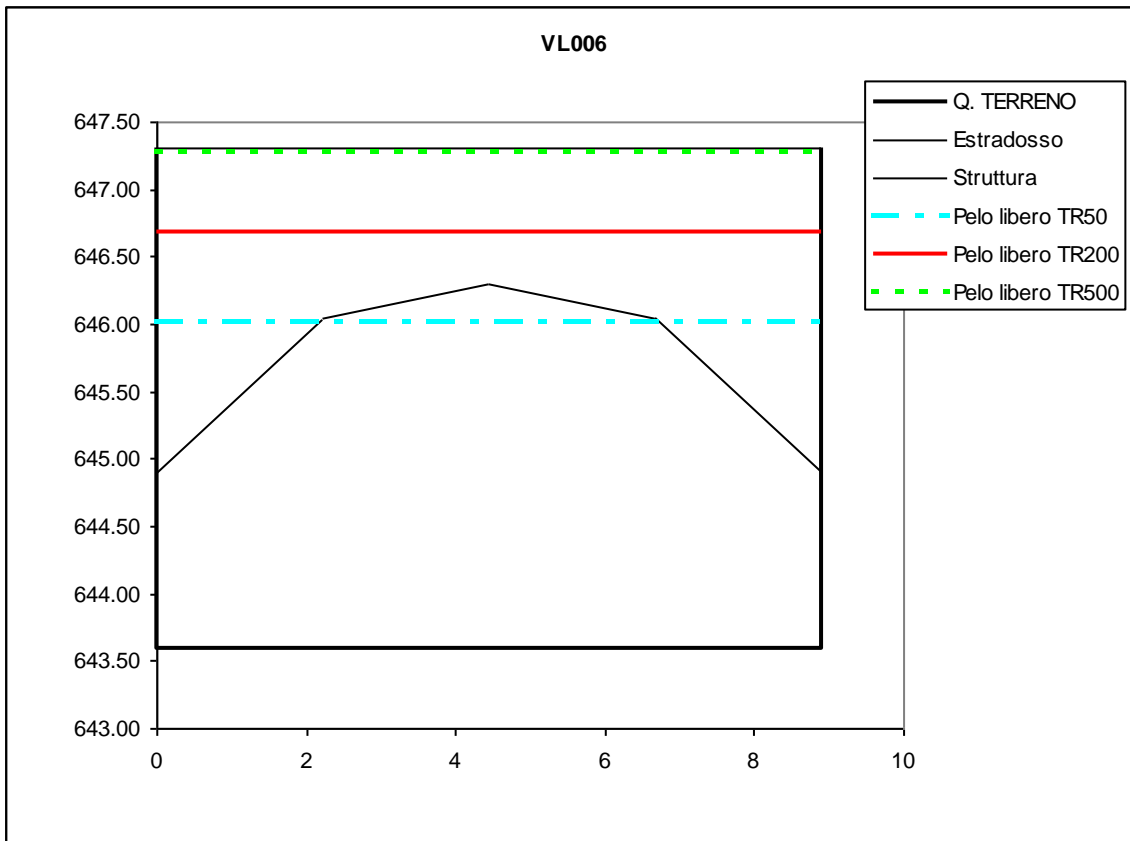
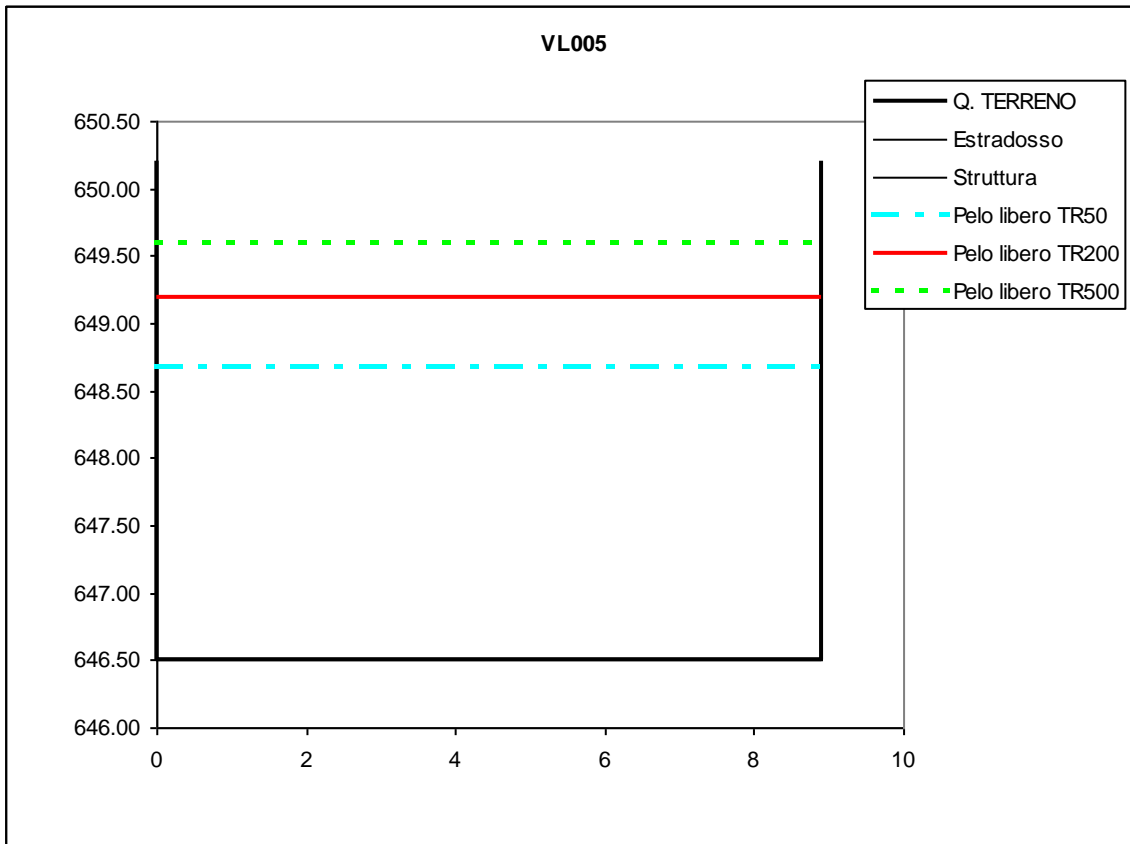




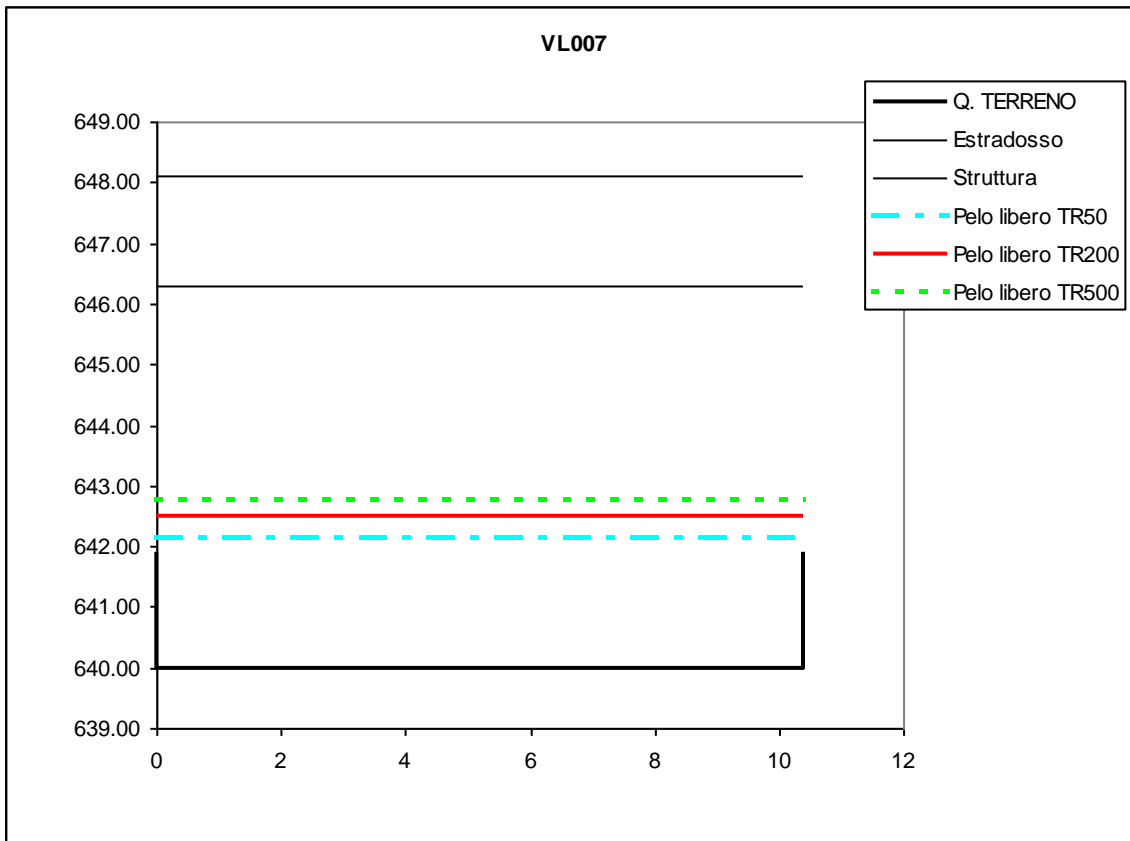
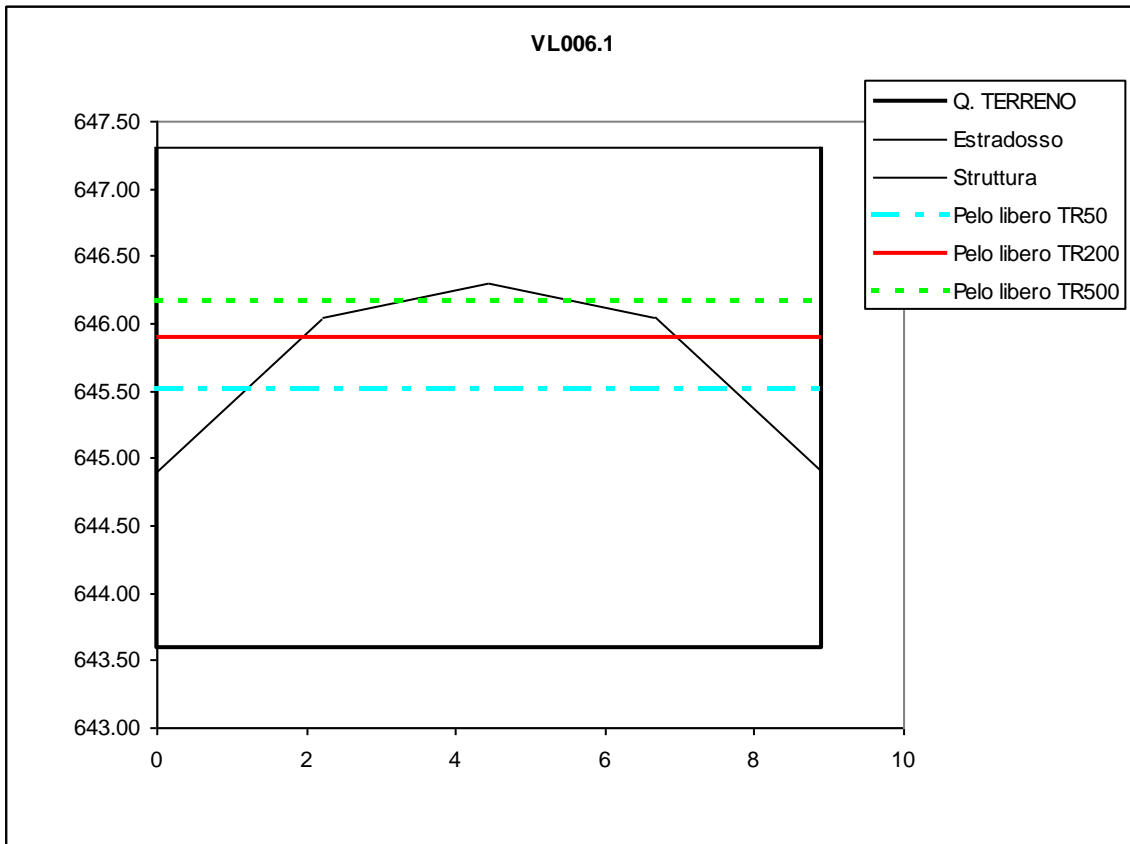
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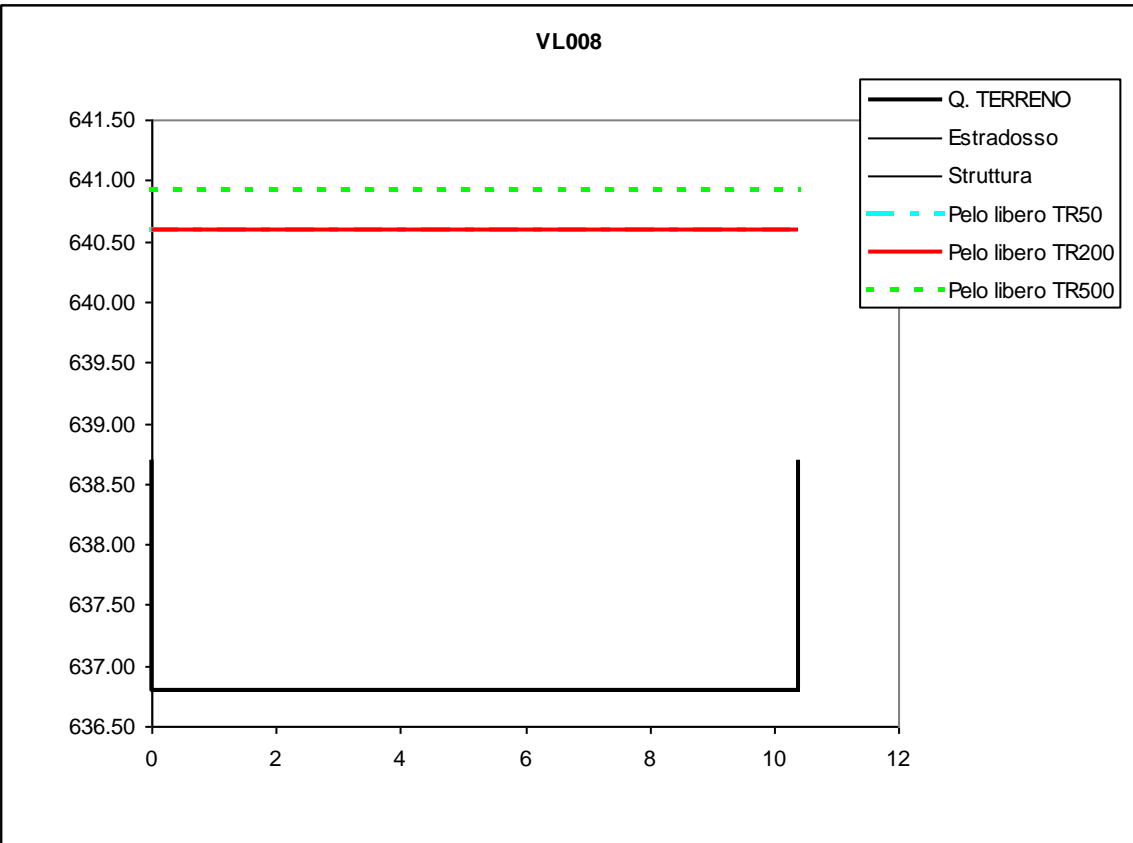
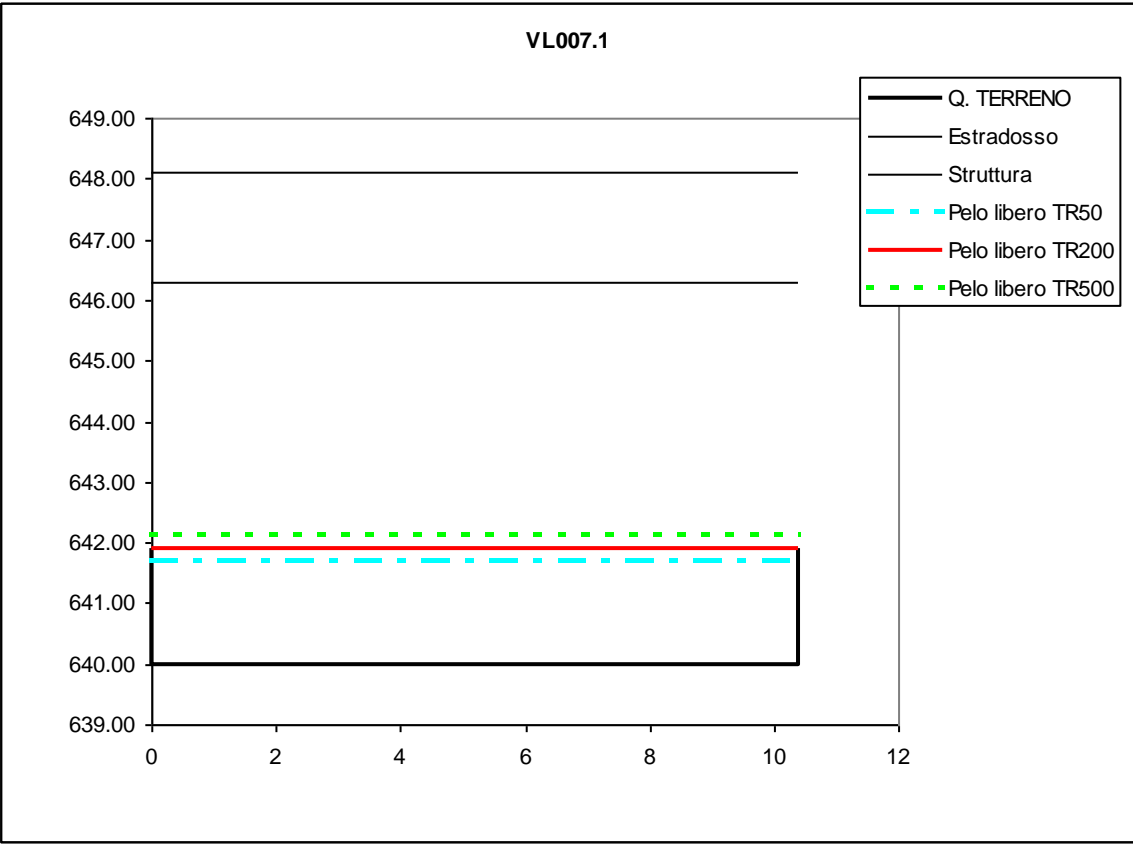




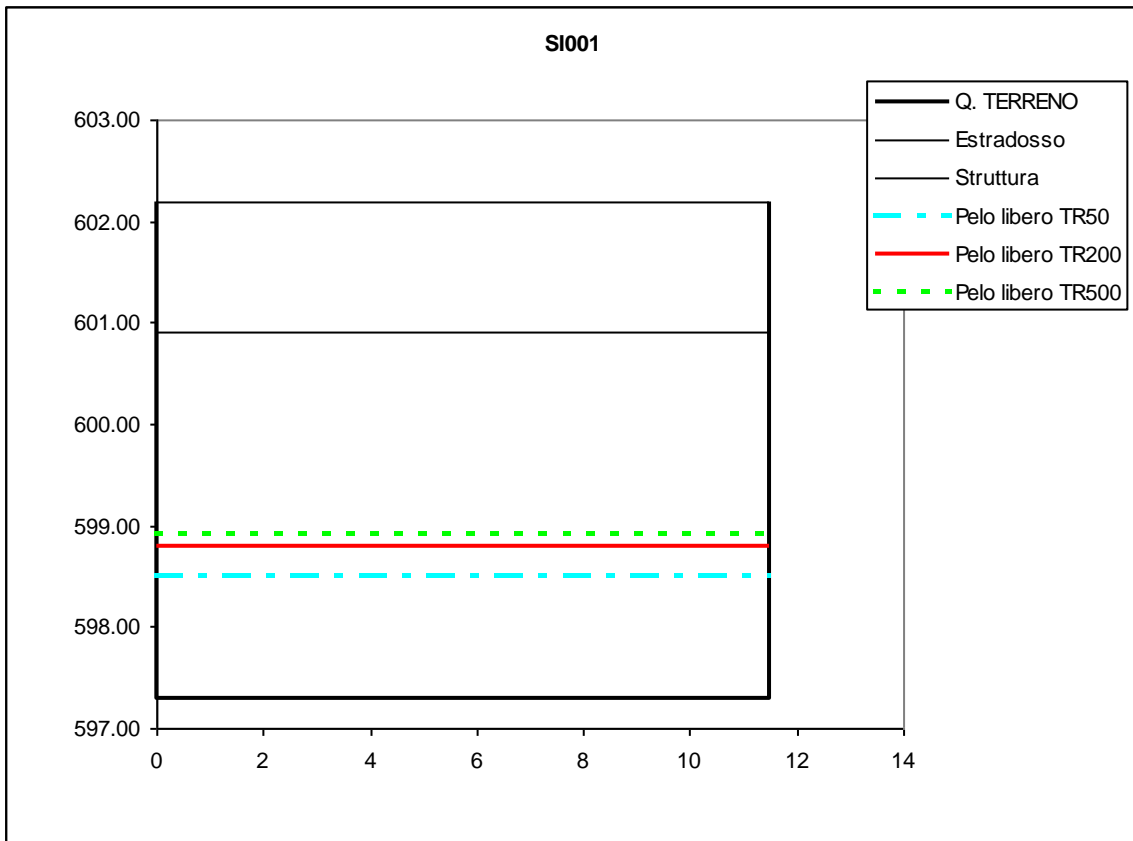
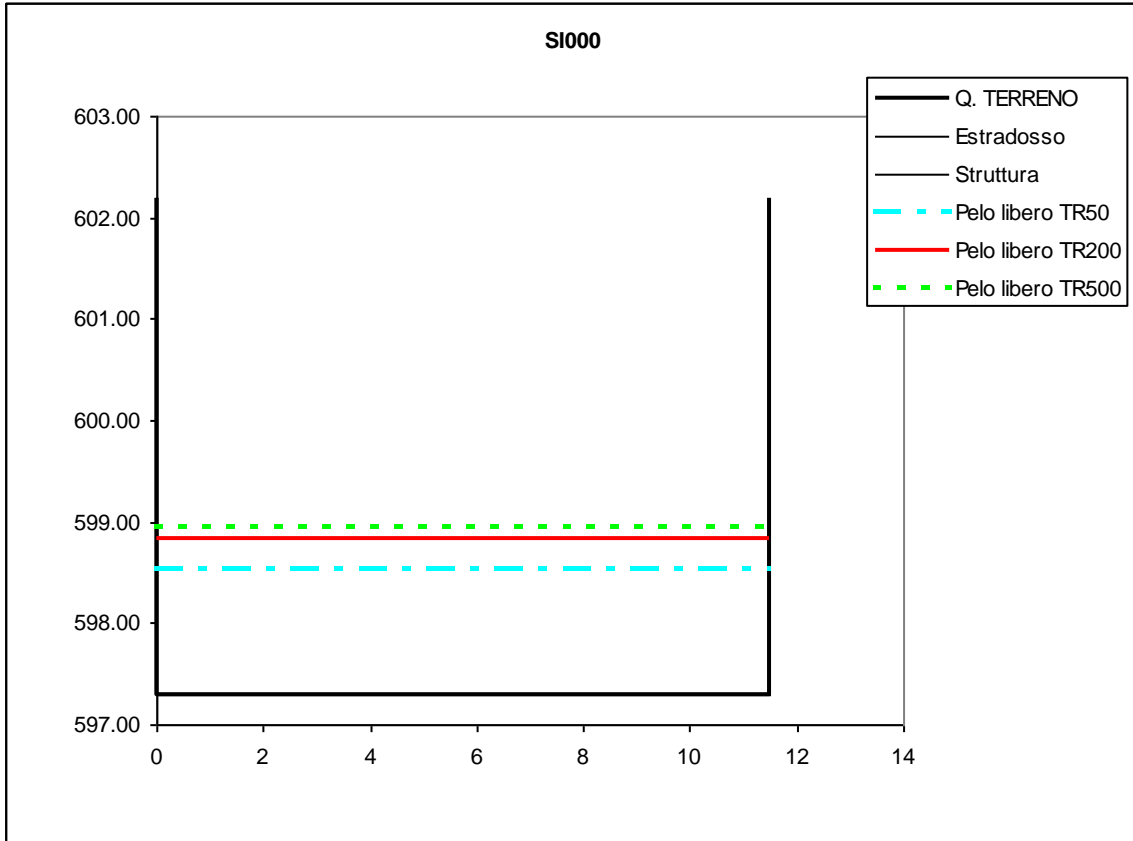




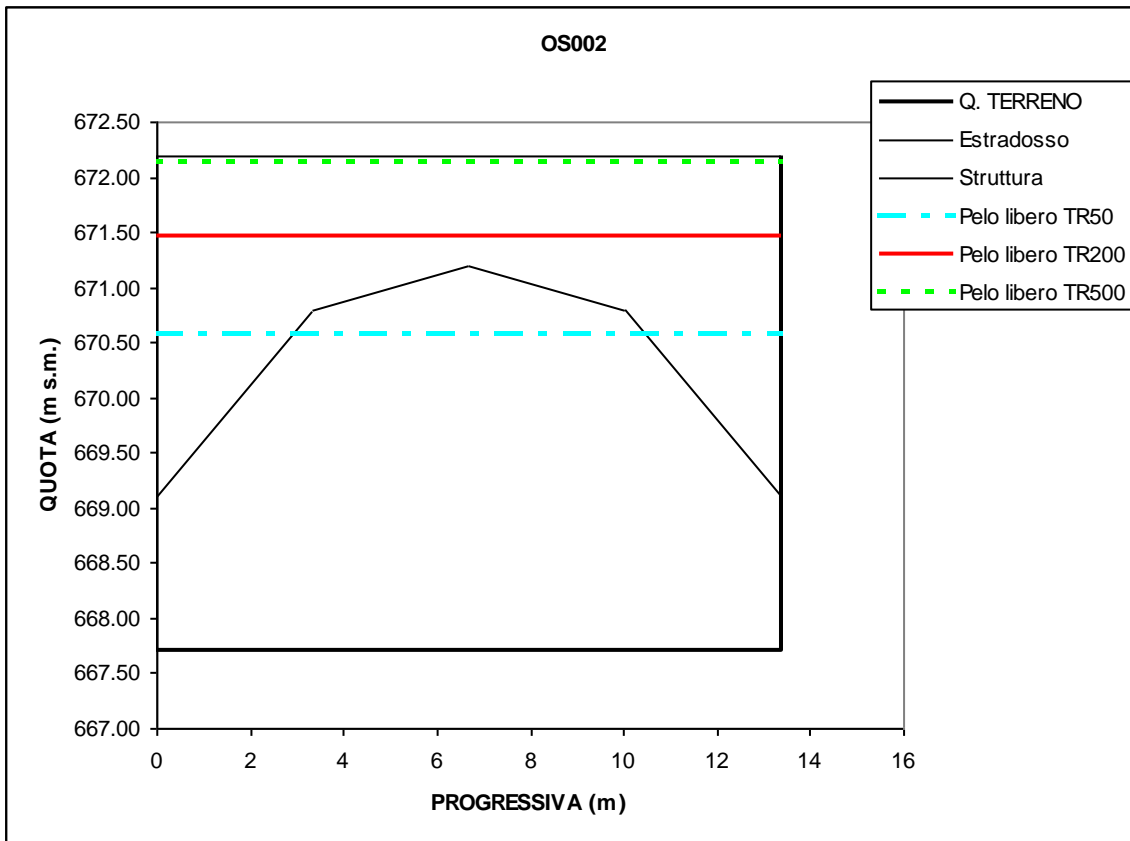
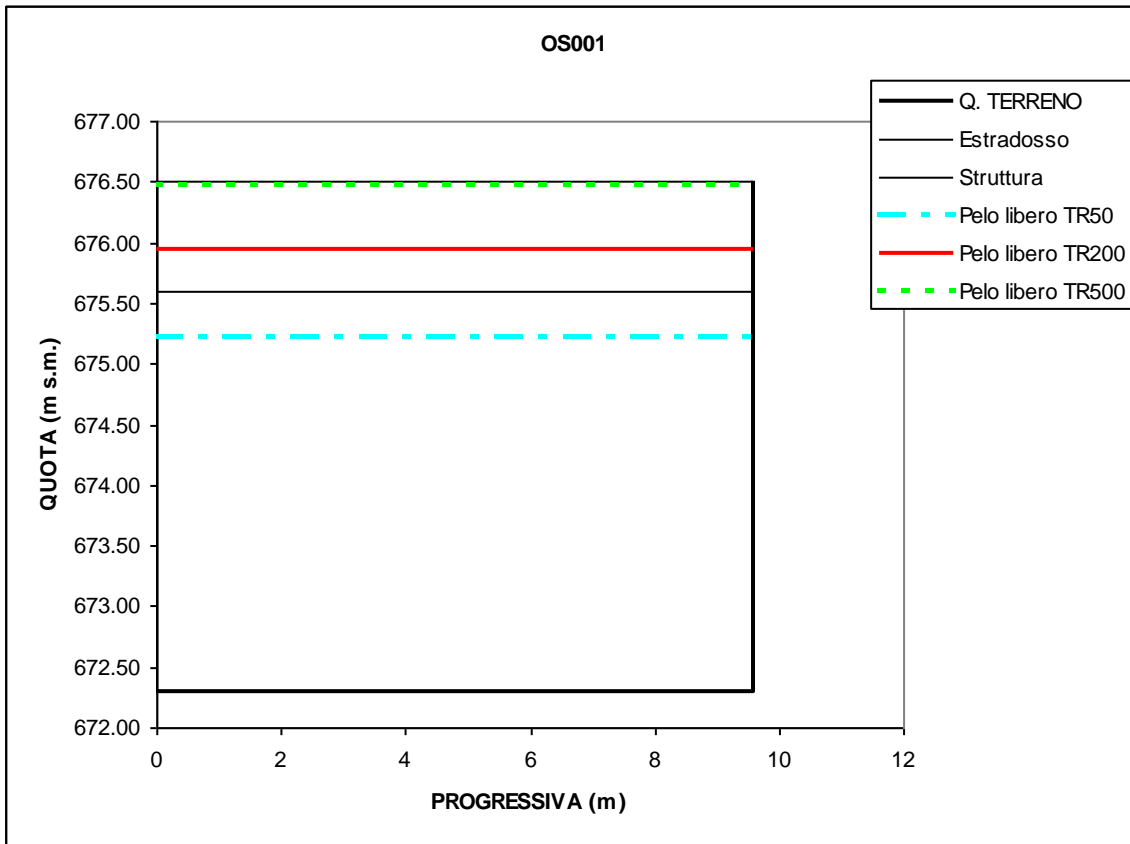


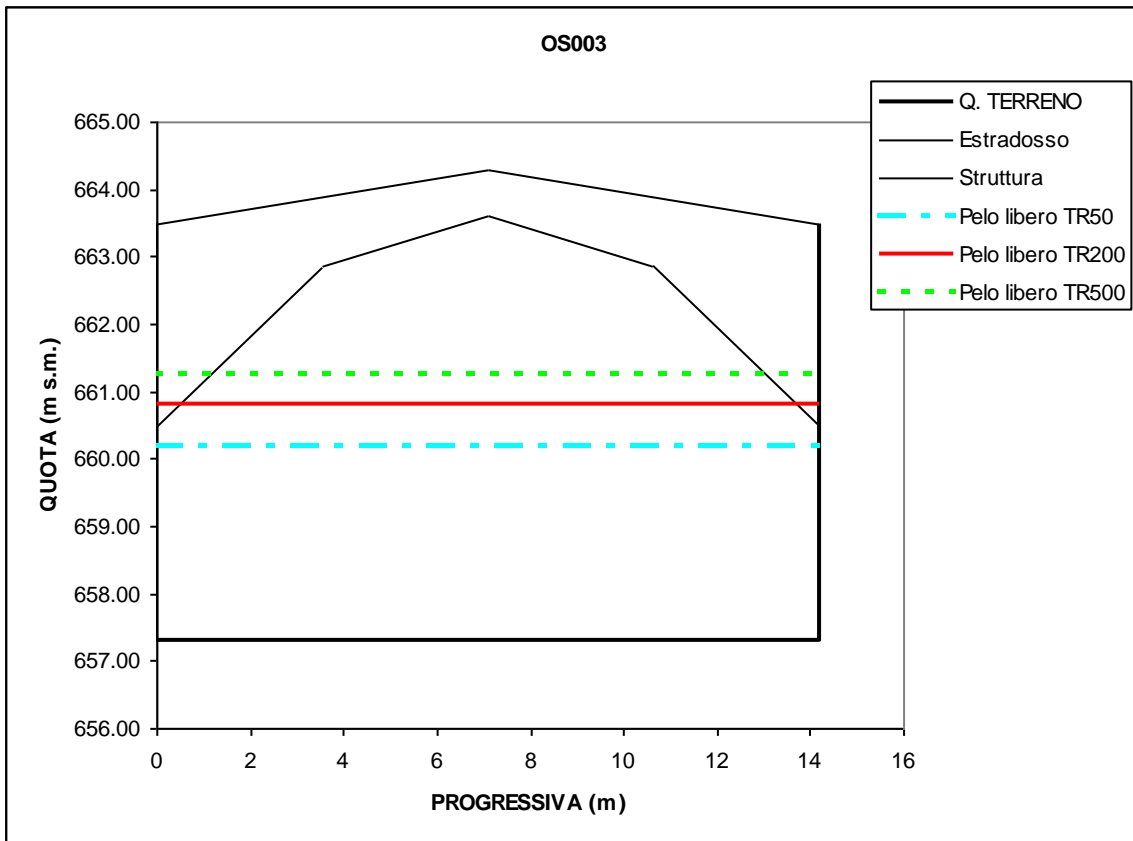
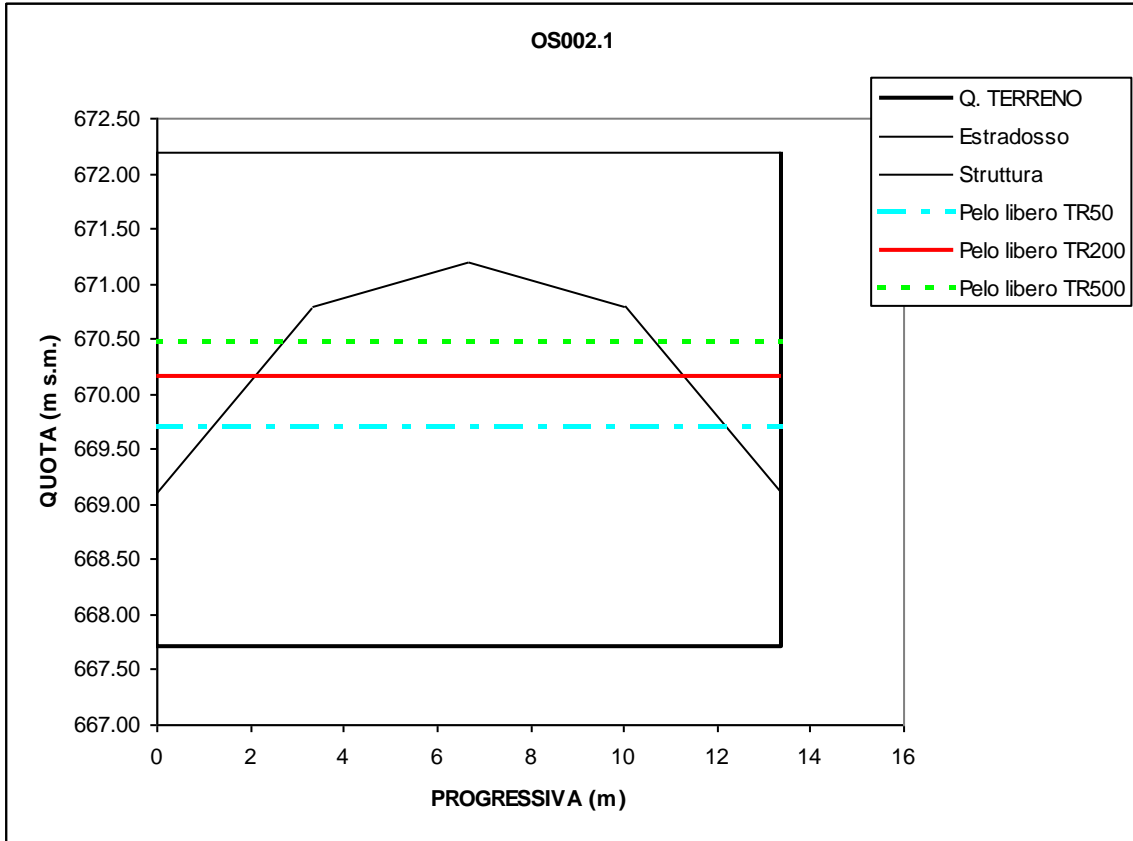


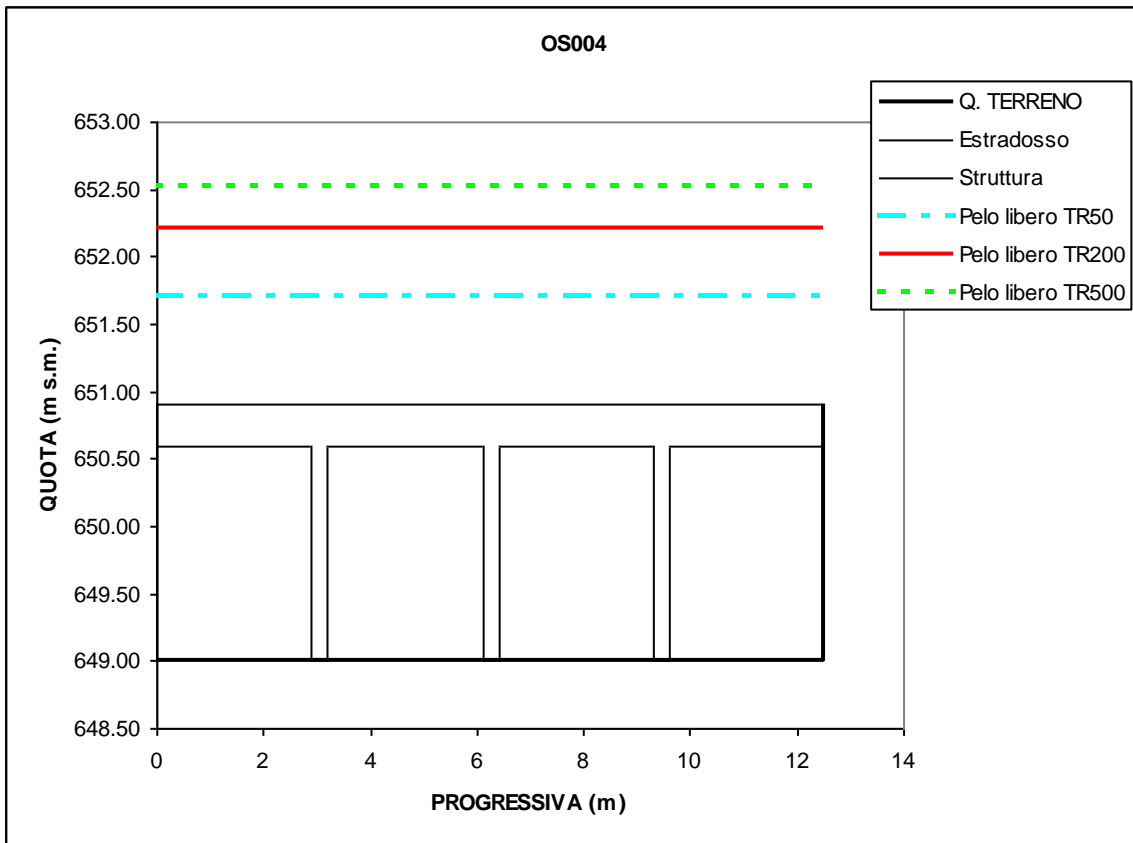
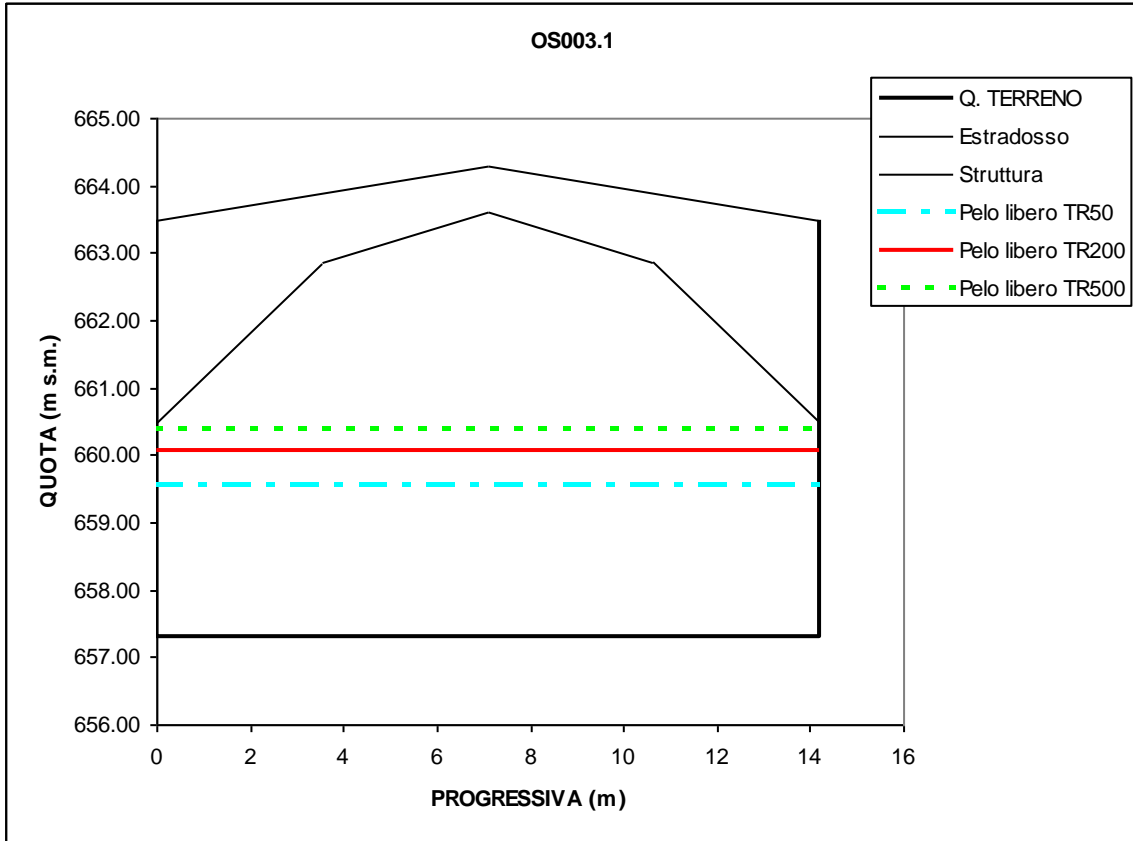
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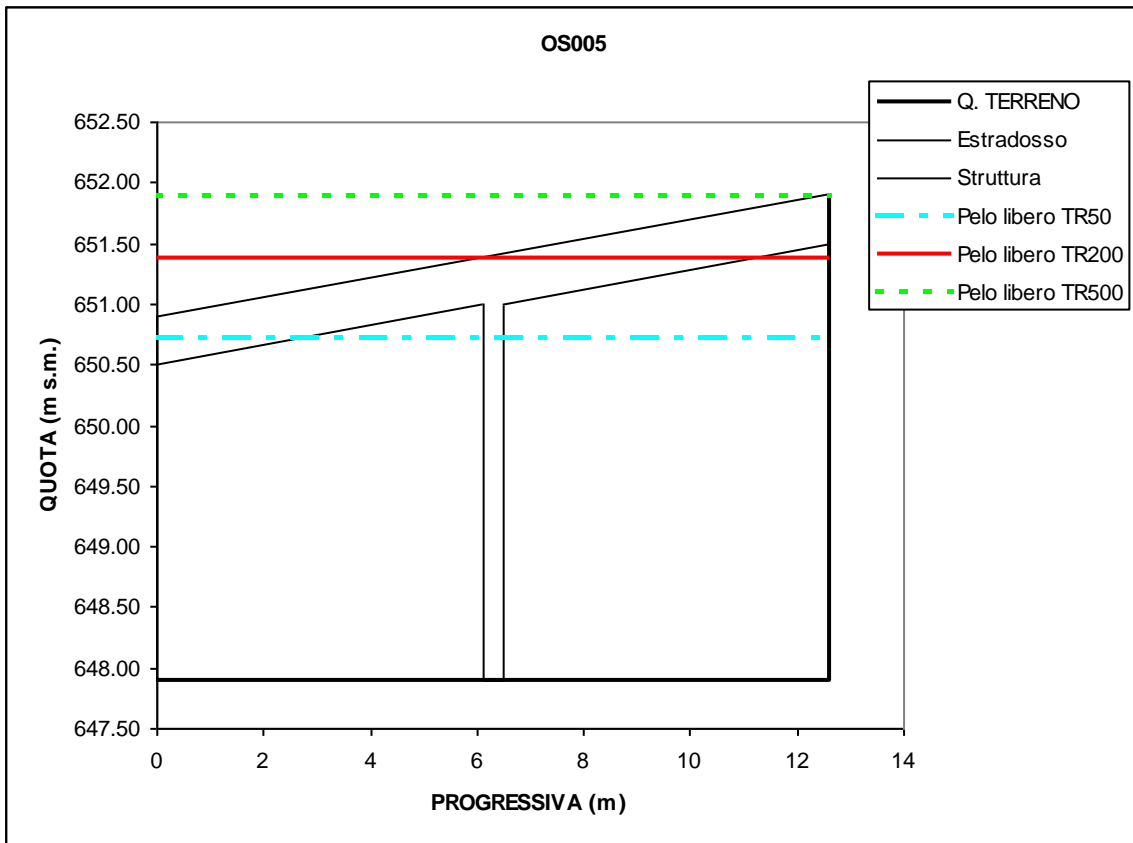
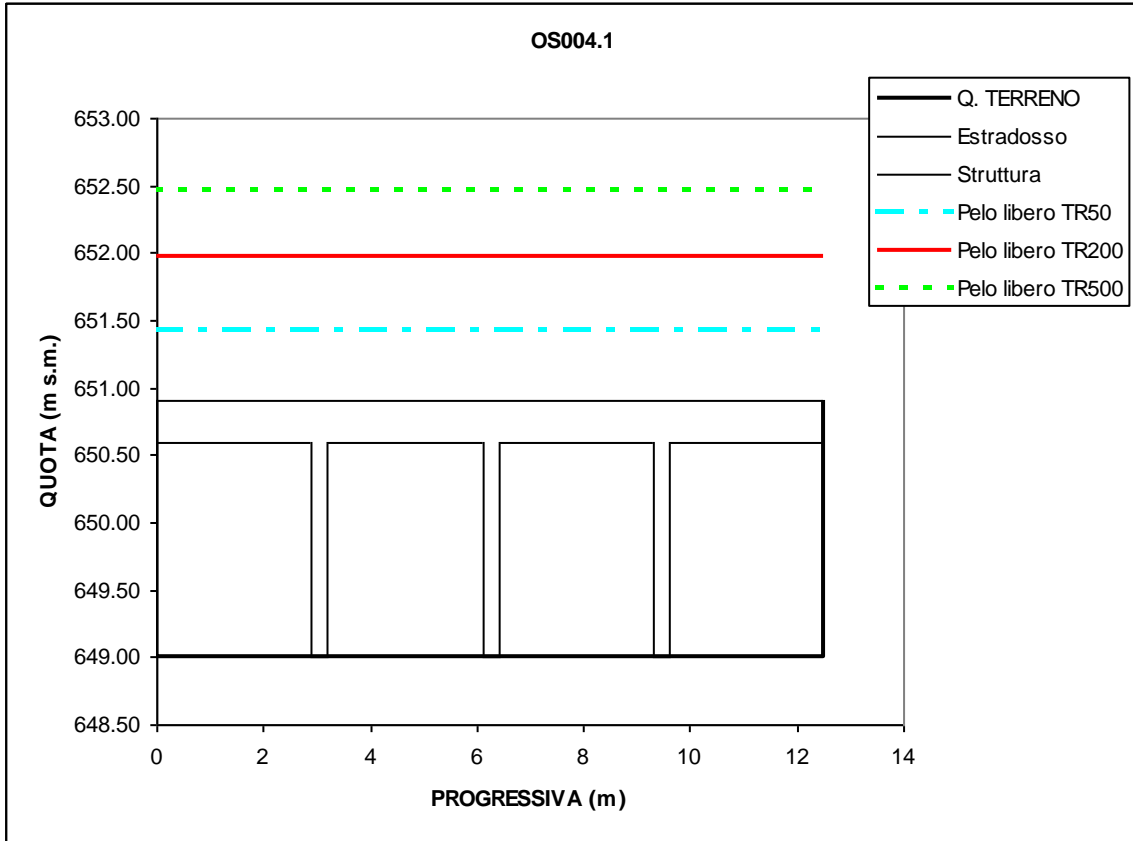
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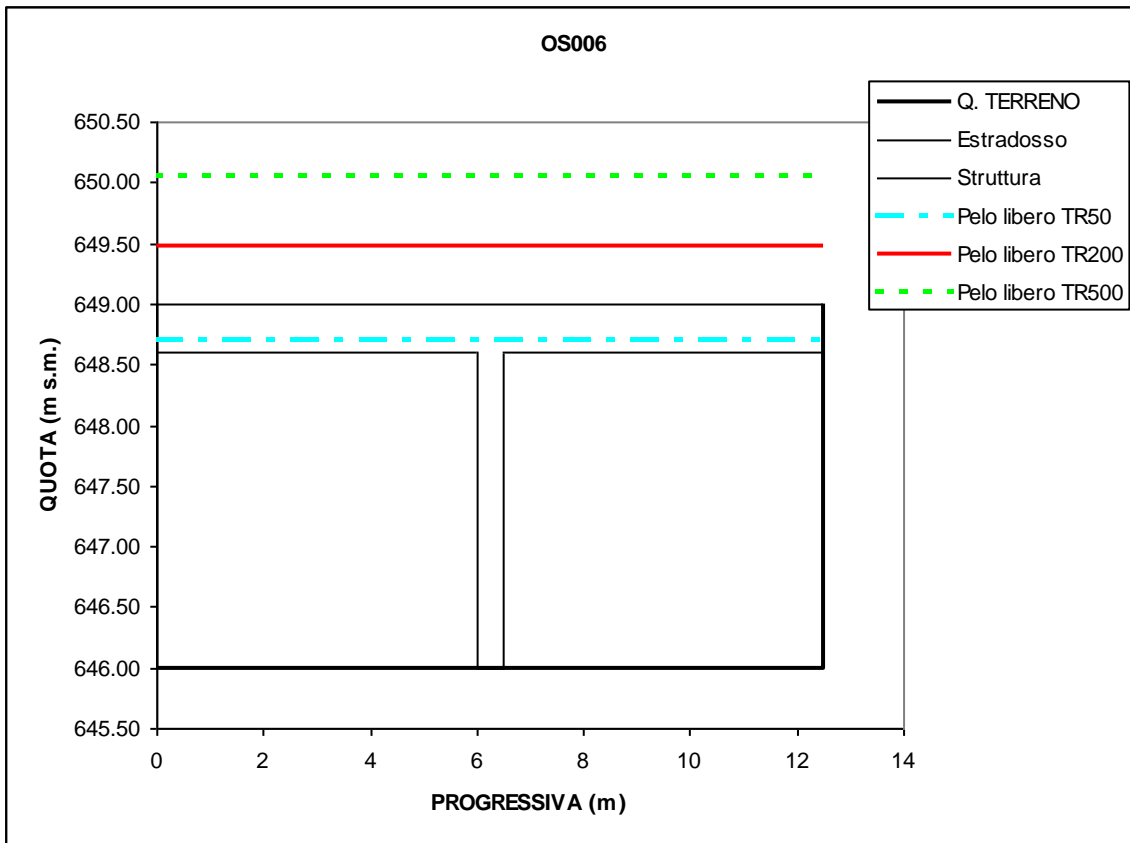
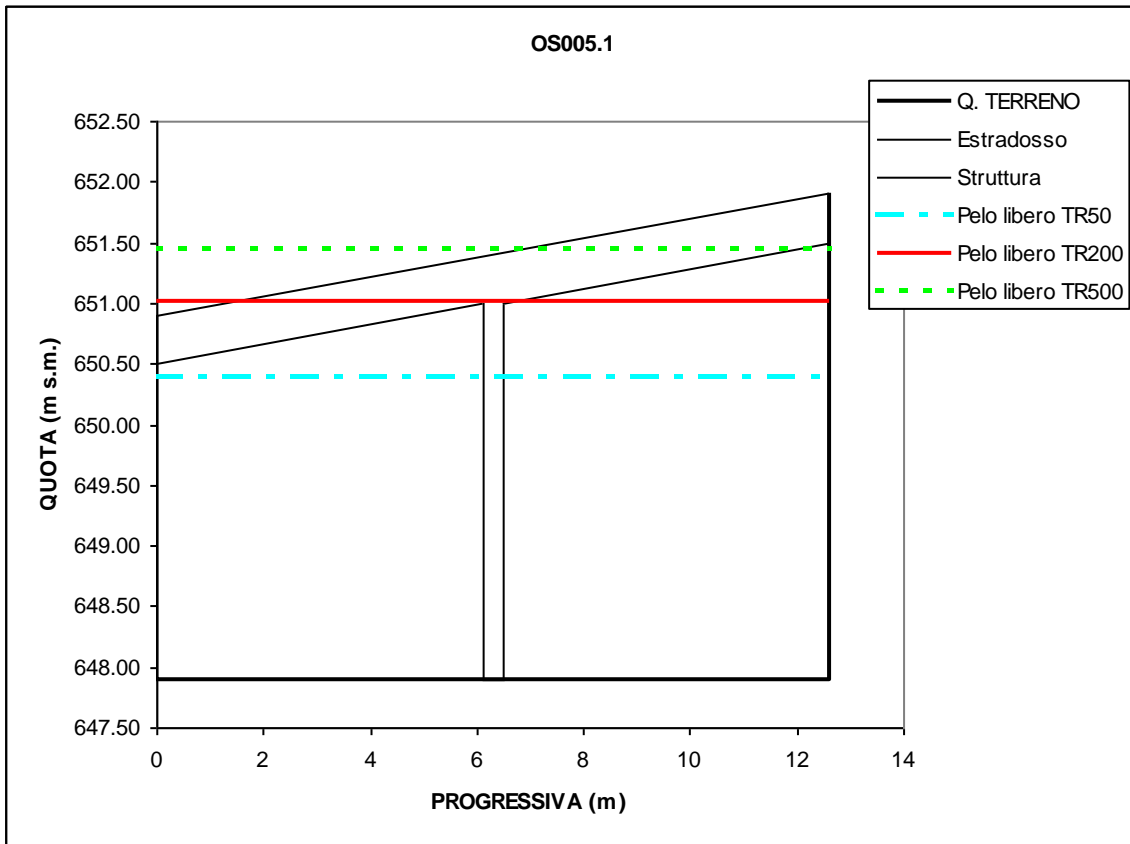


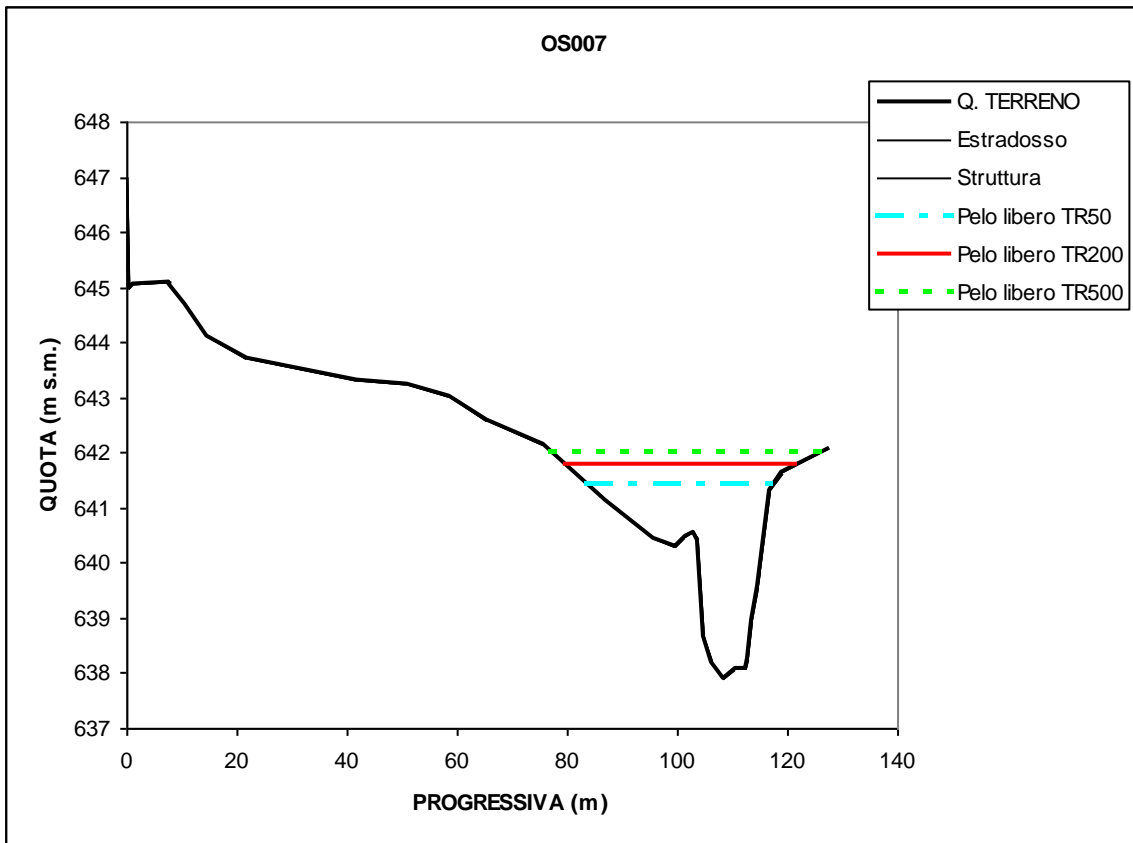
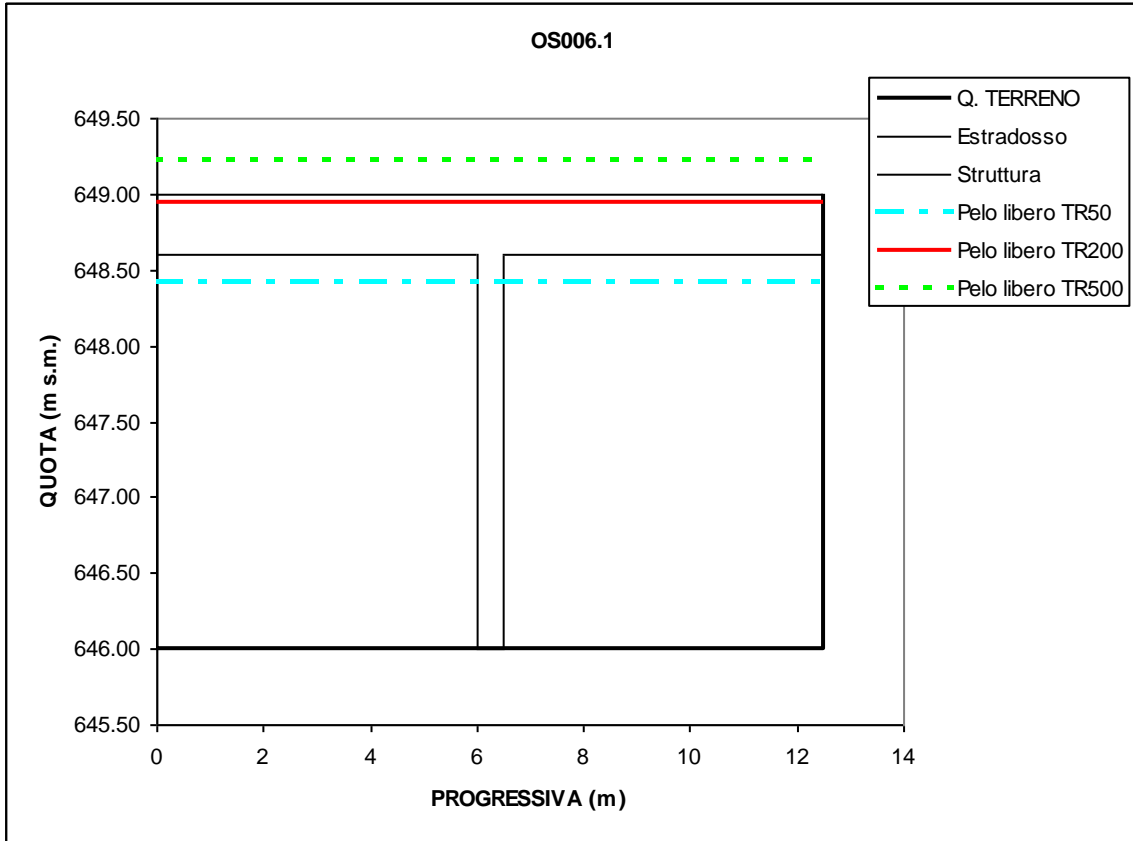


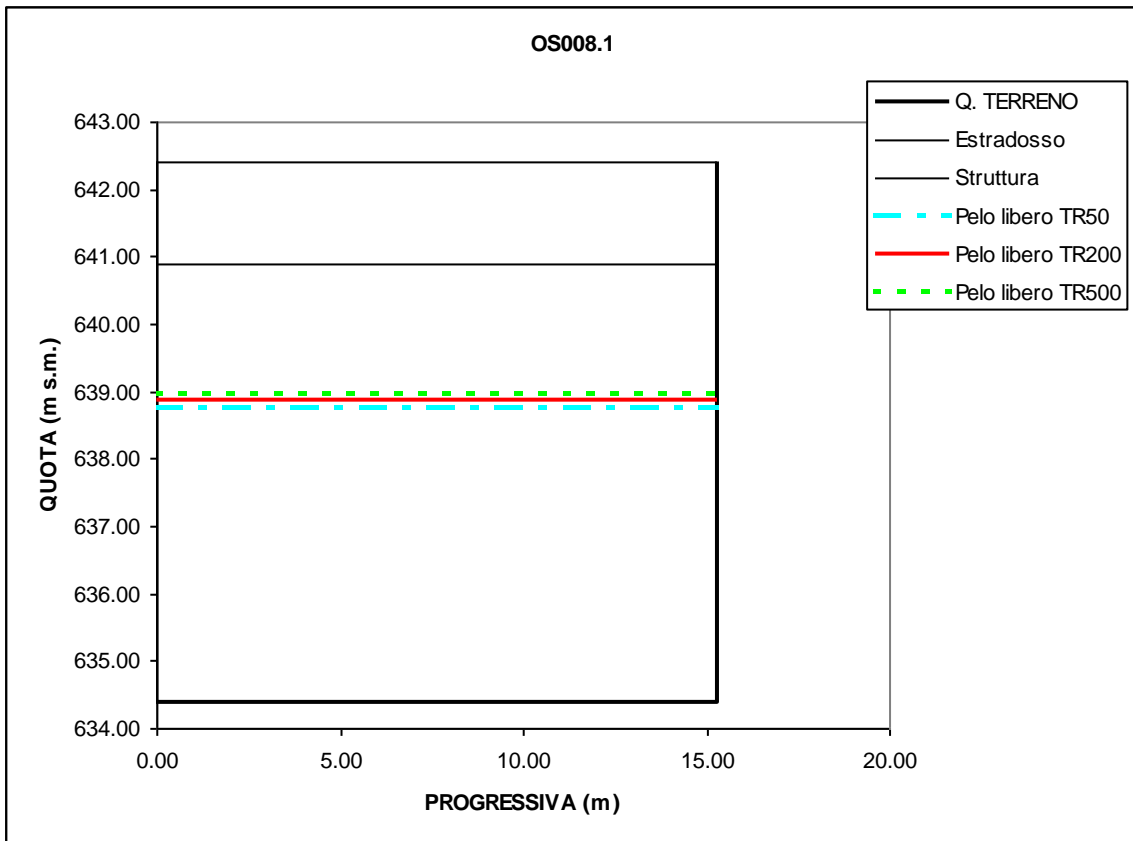
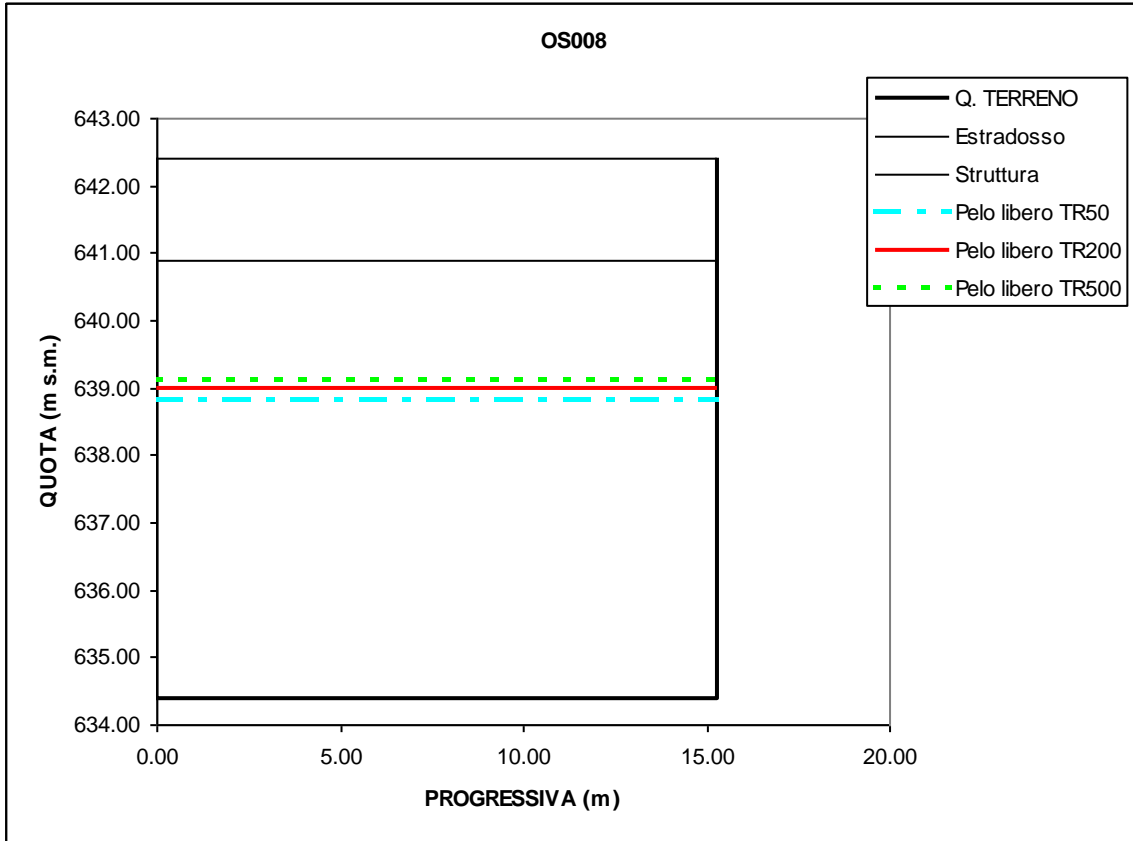


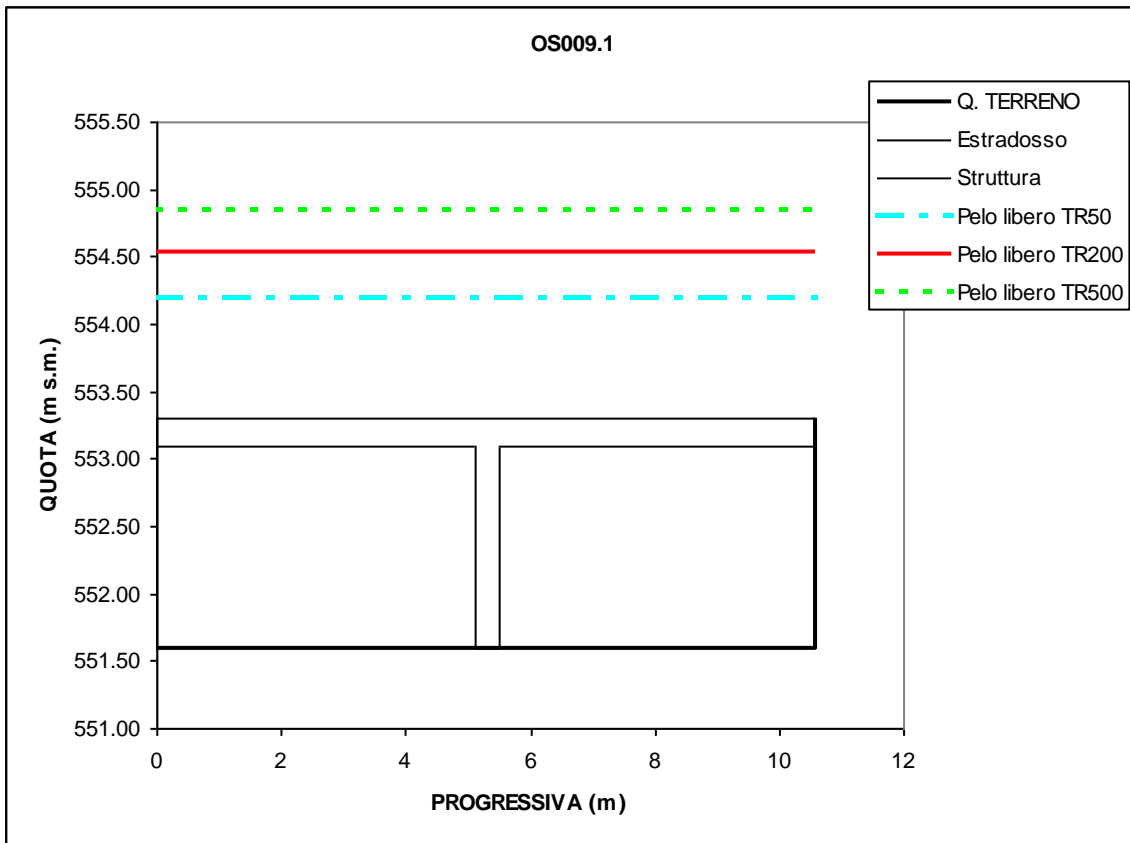
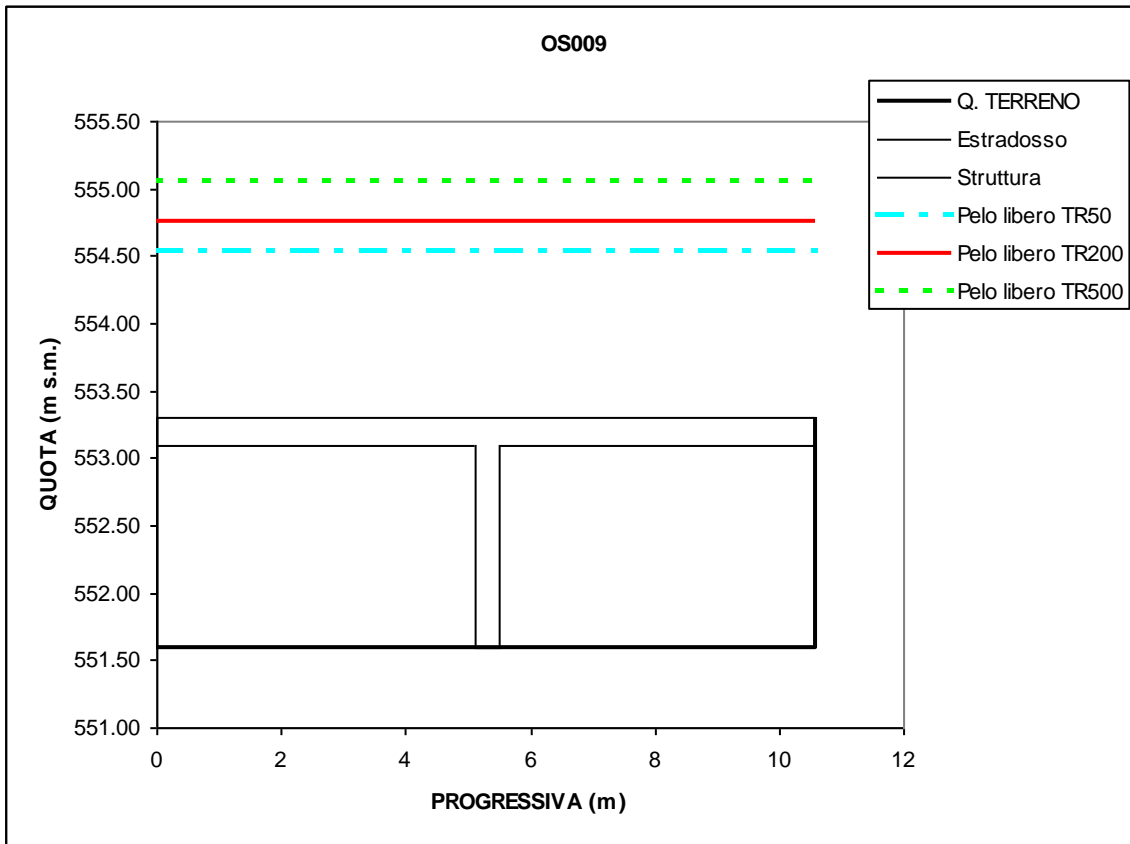


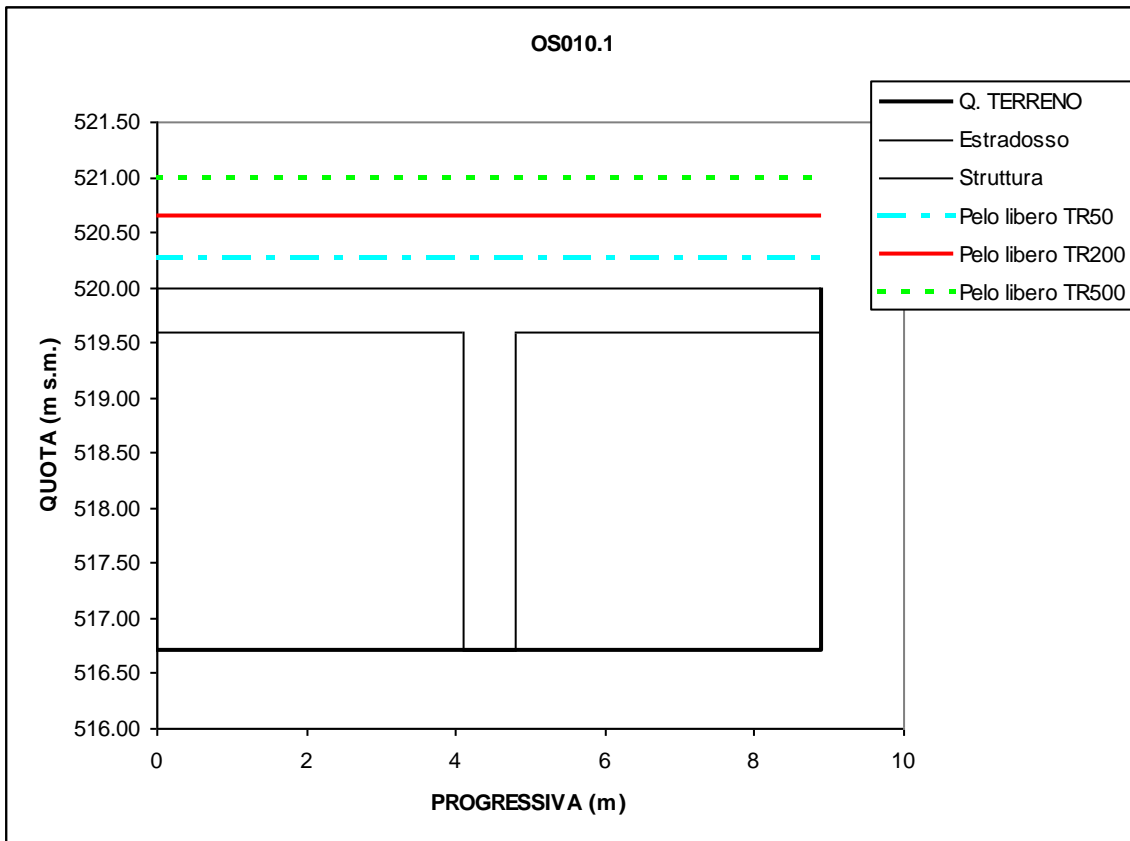
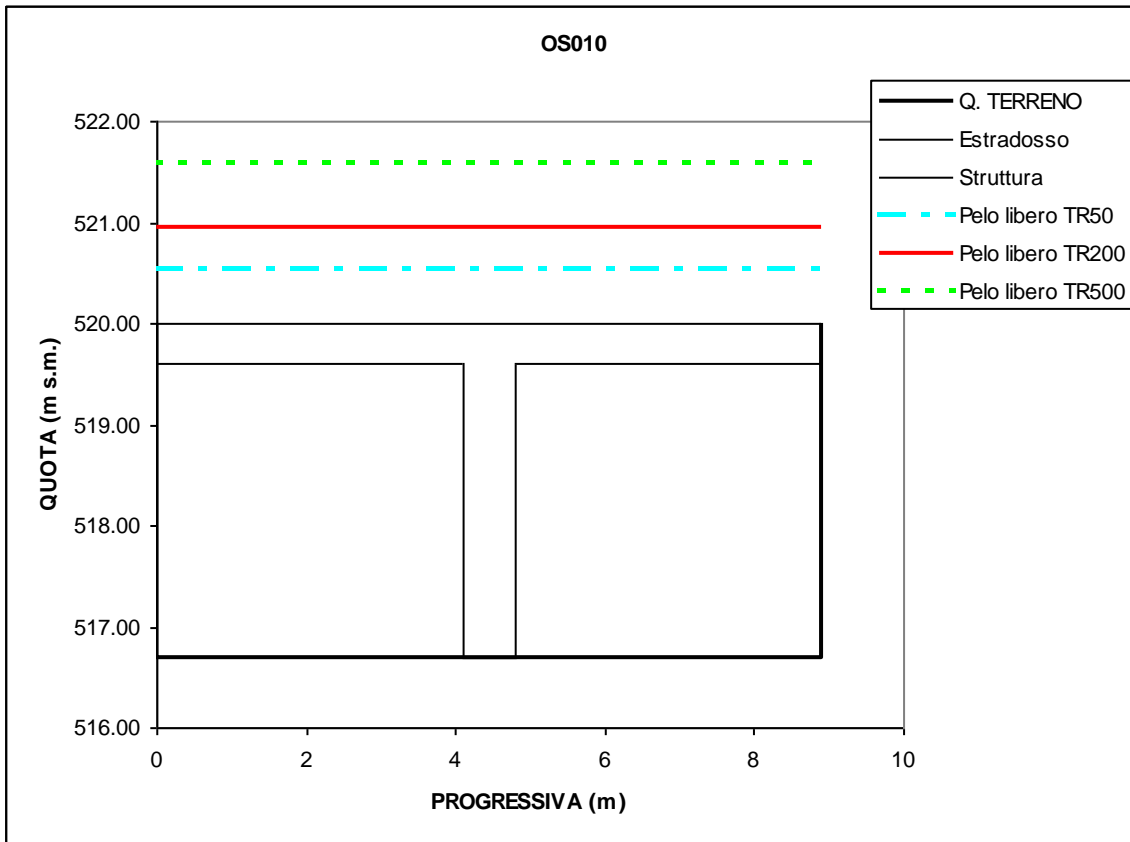


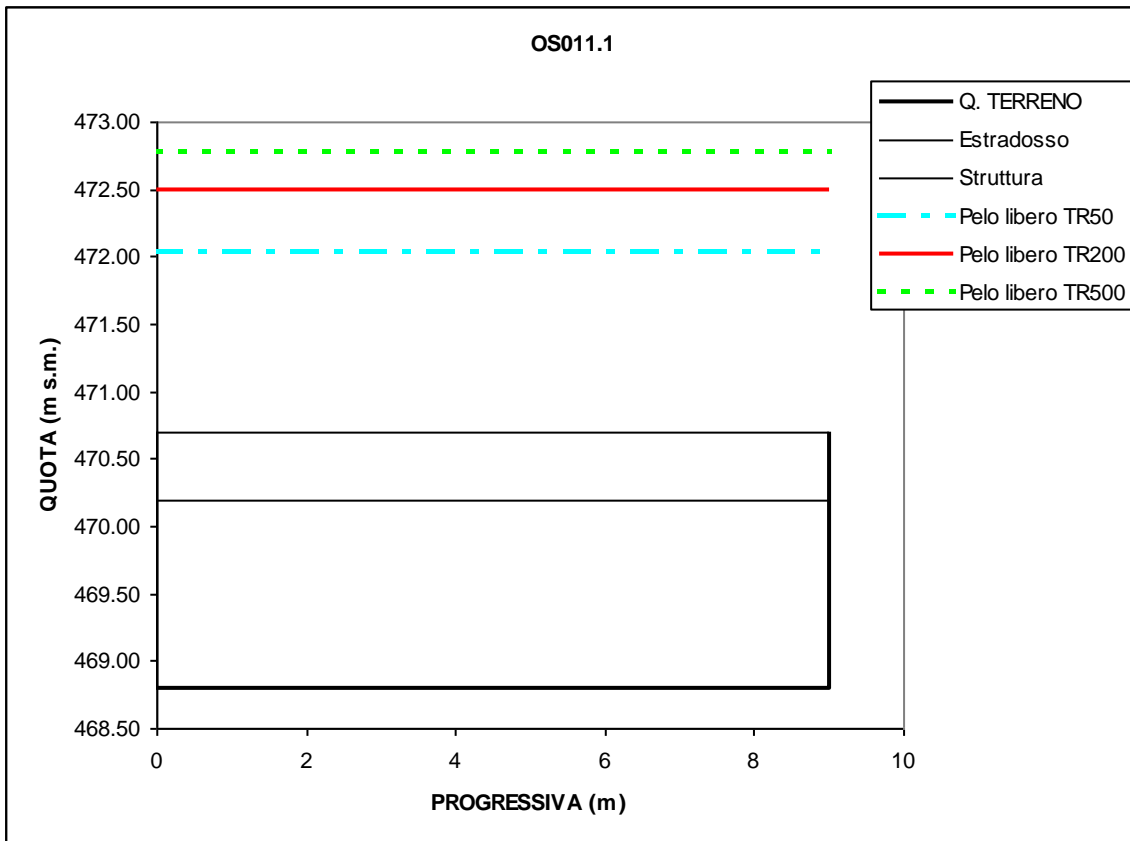
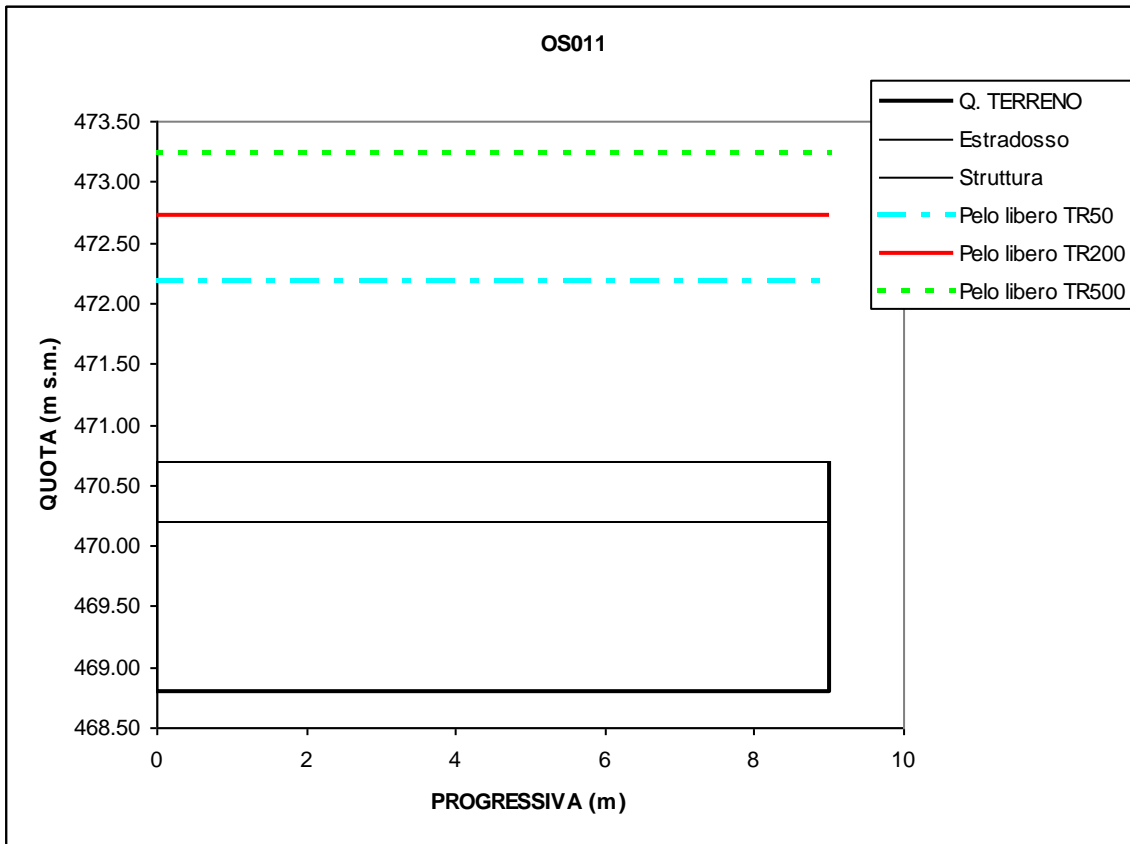


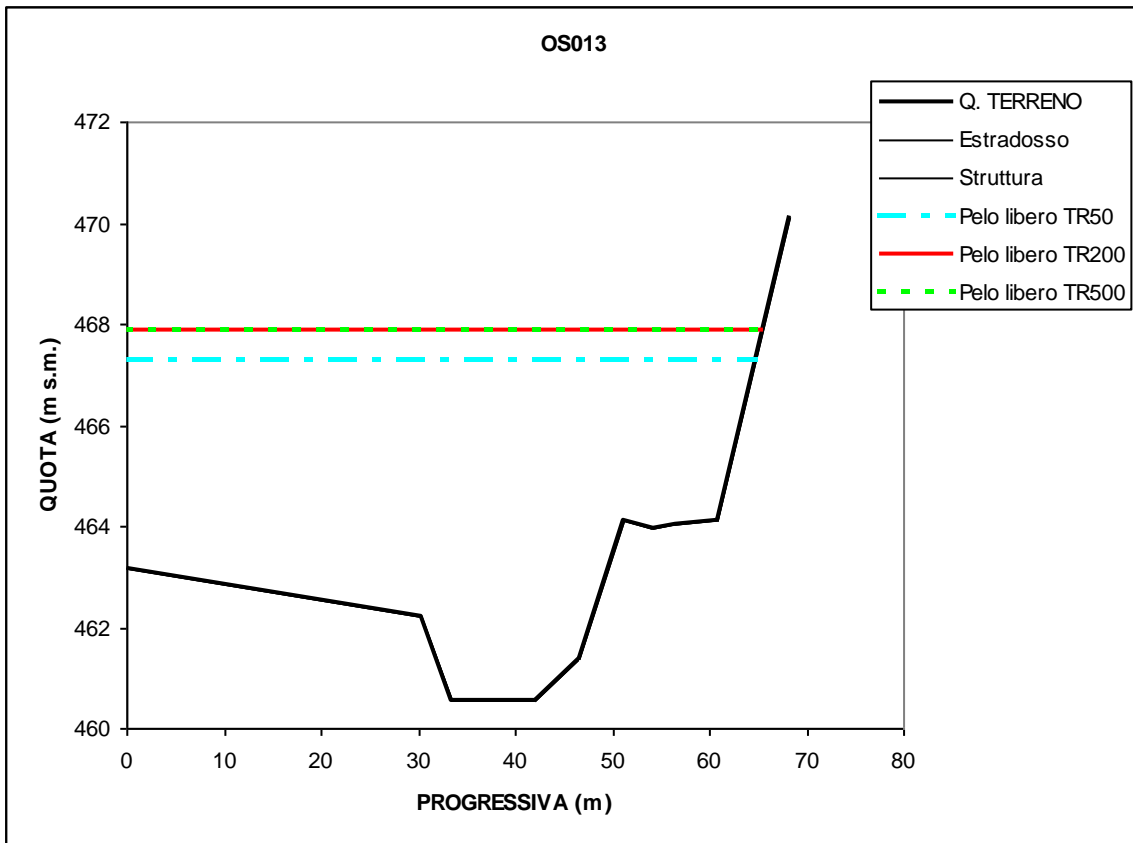
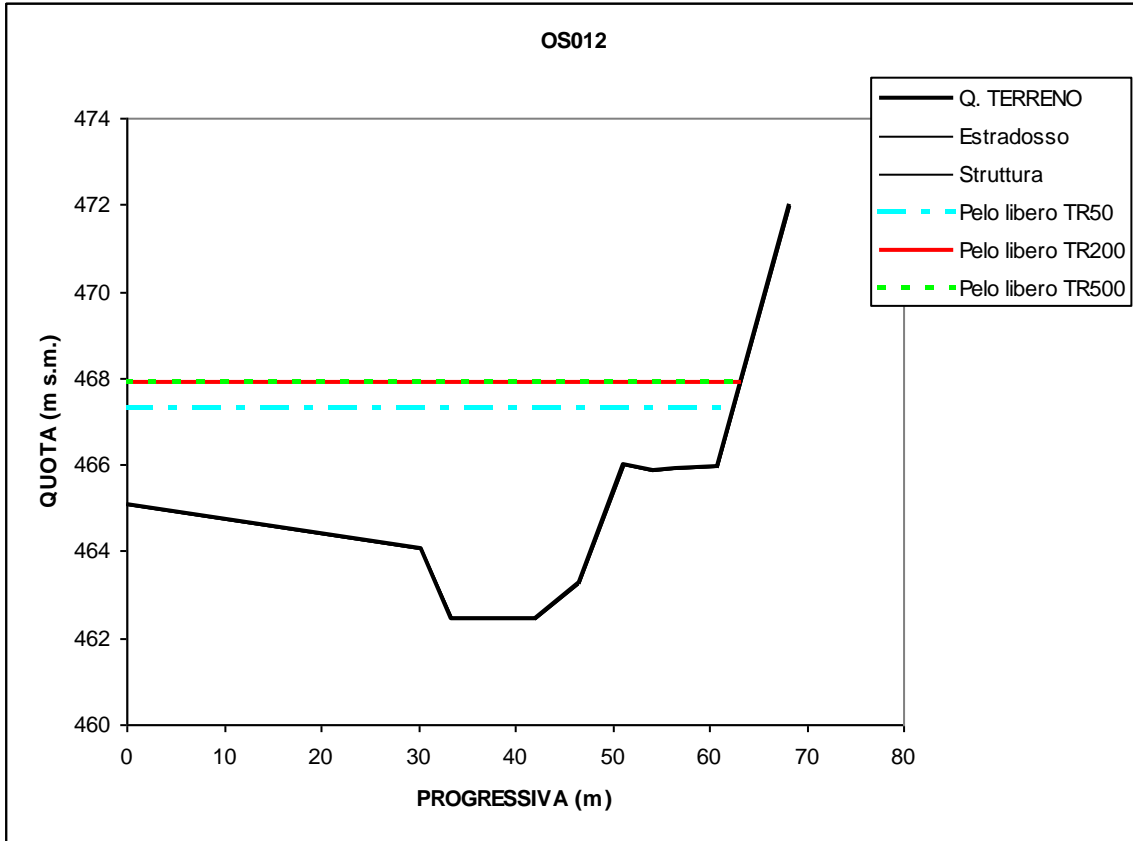






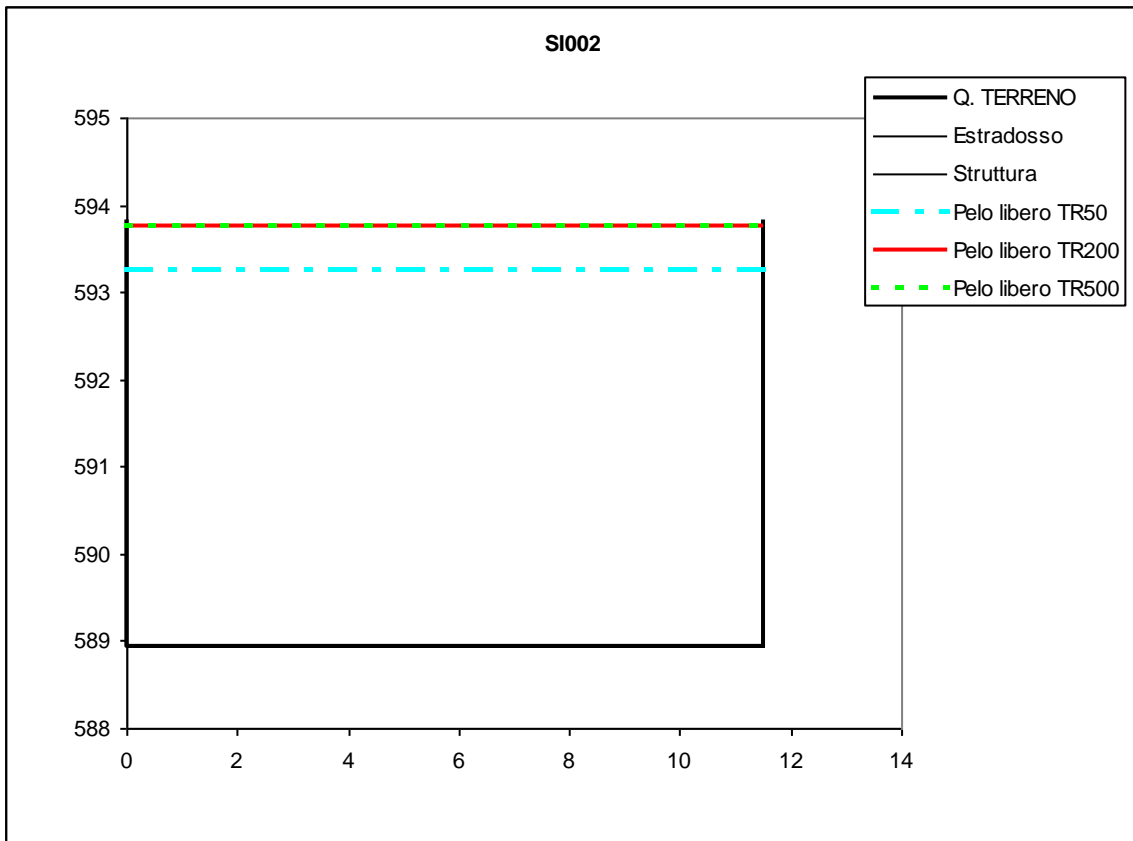
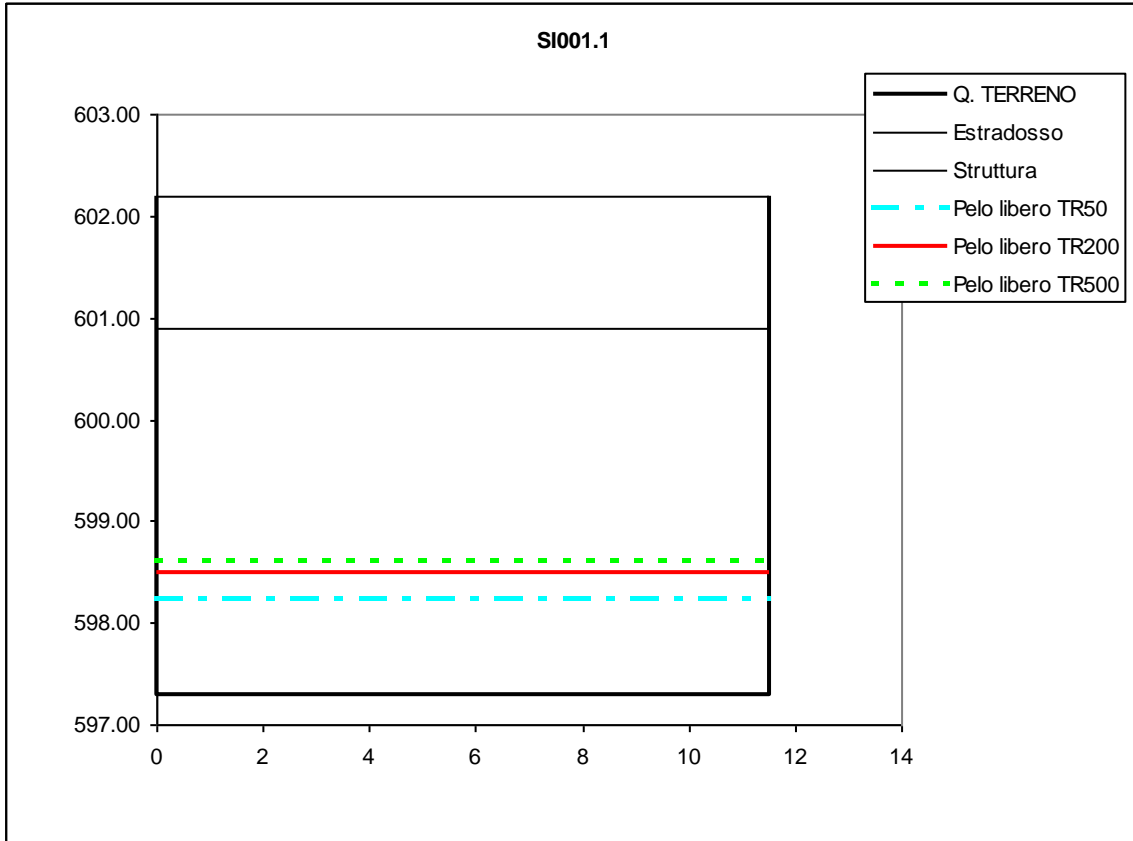


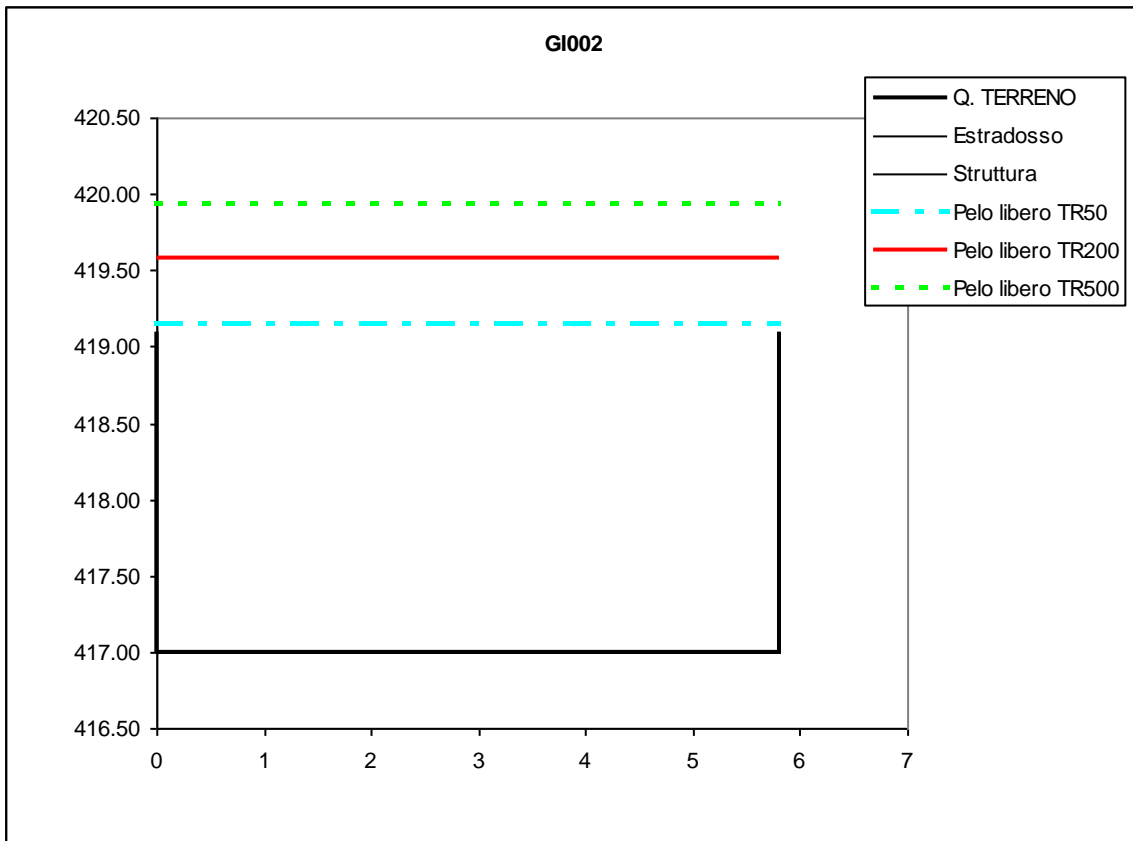
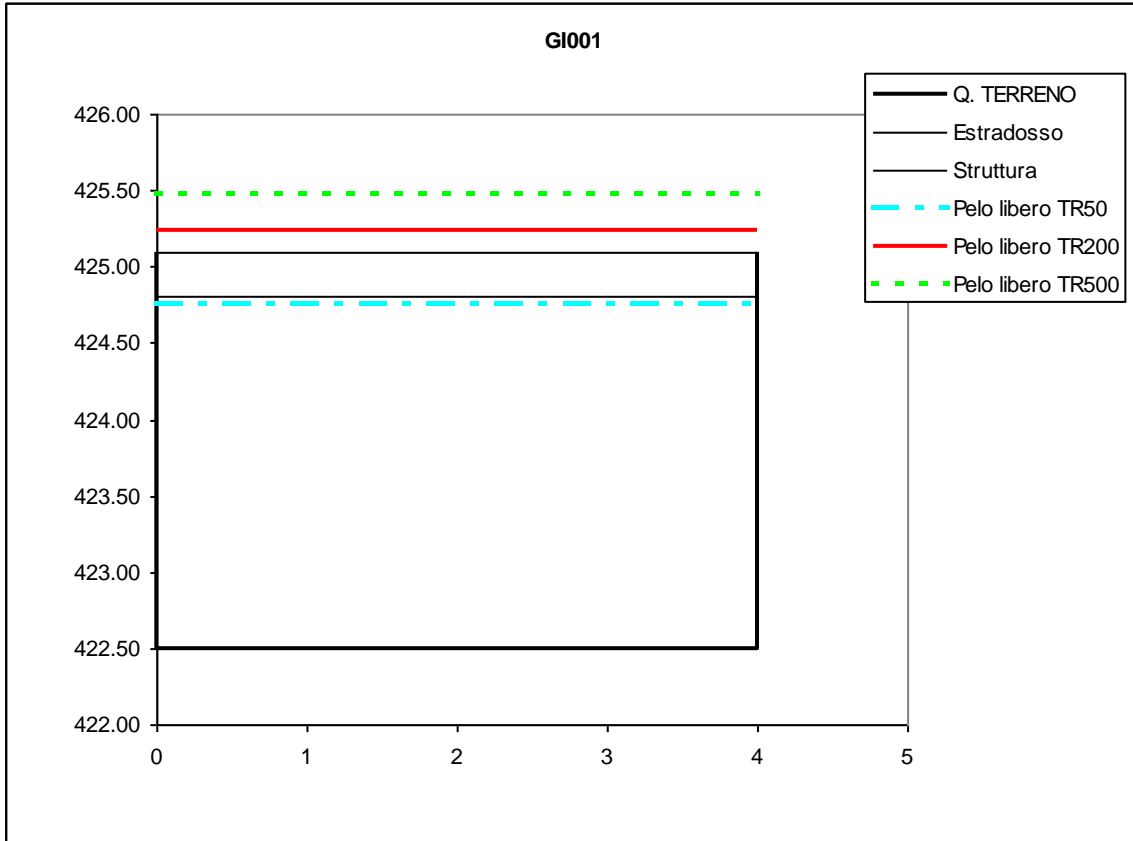


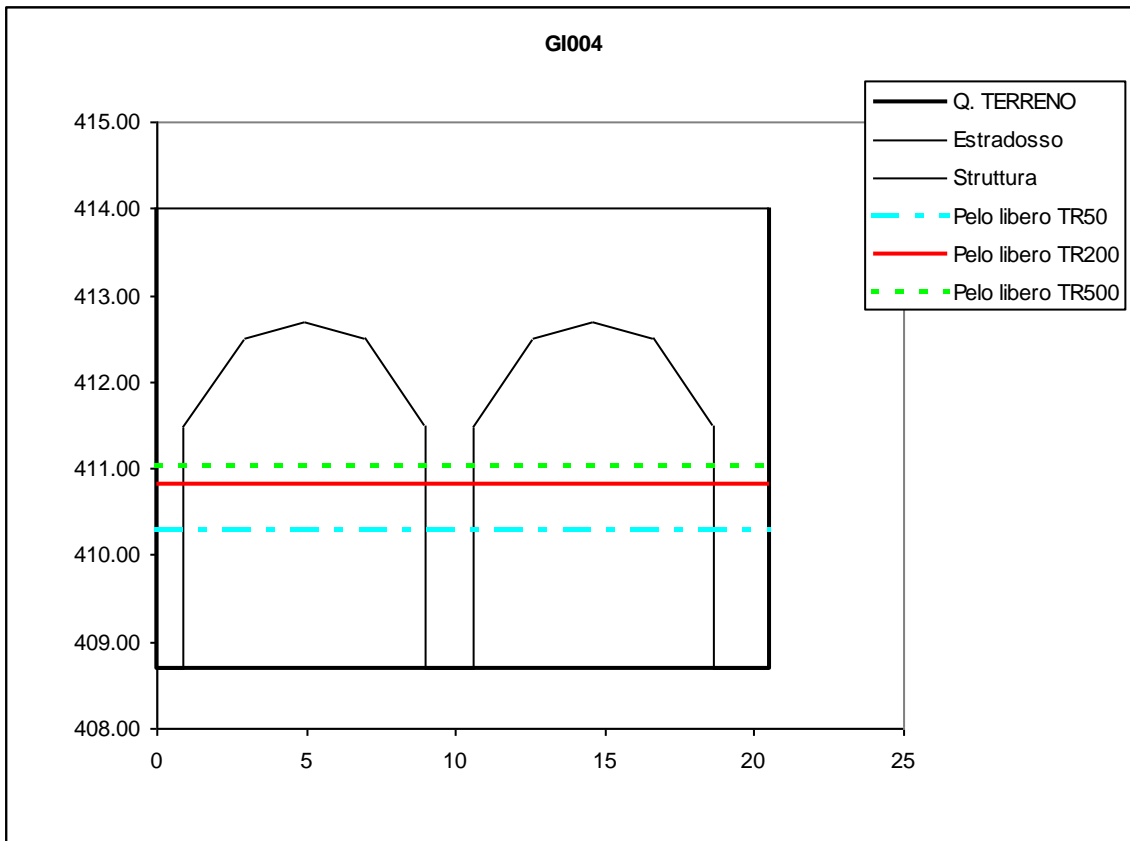
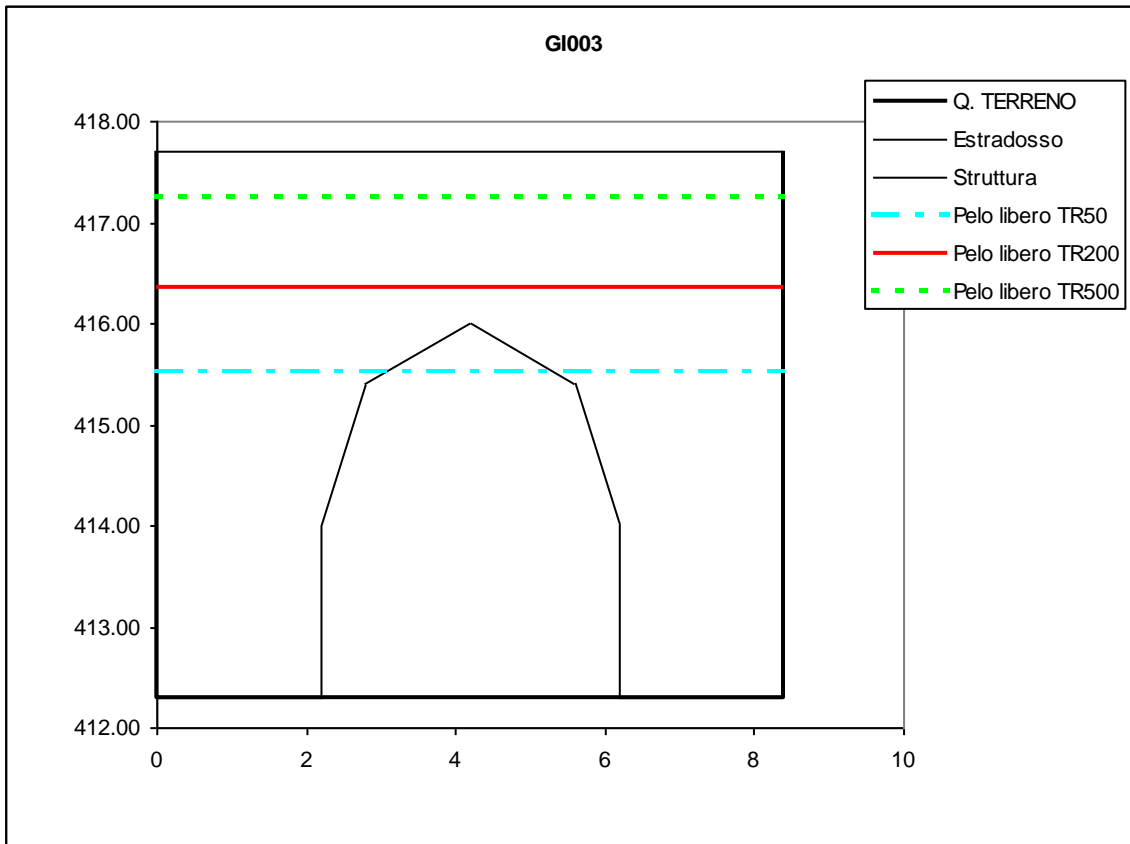


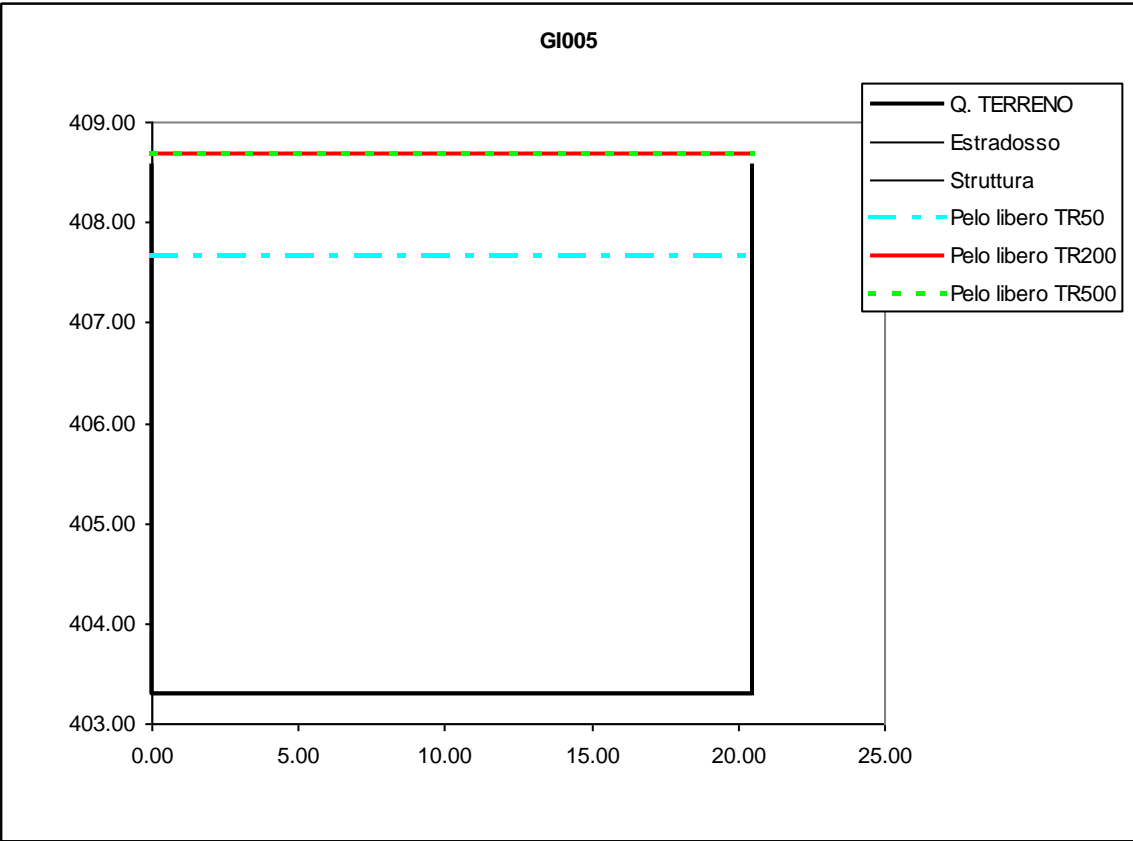


# **RIO GIACCHETTI**

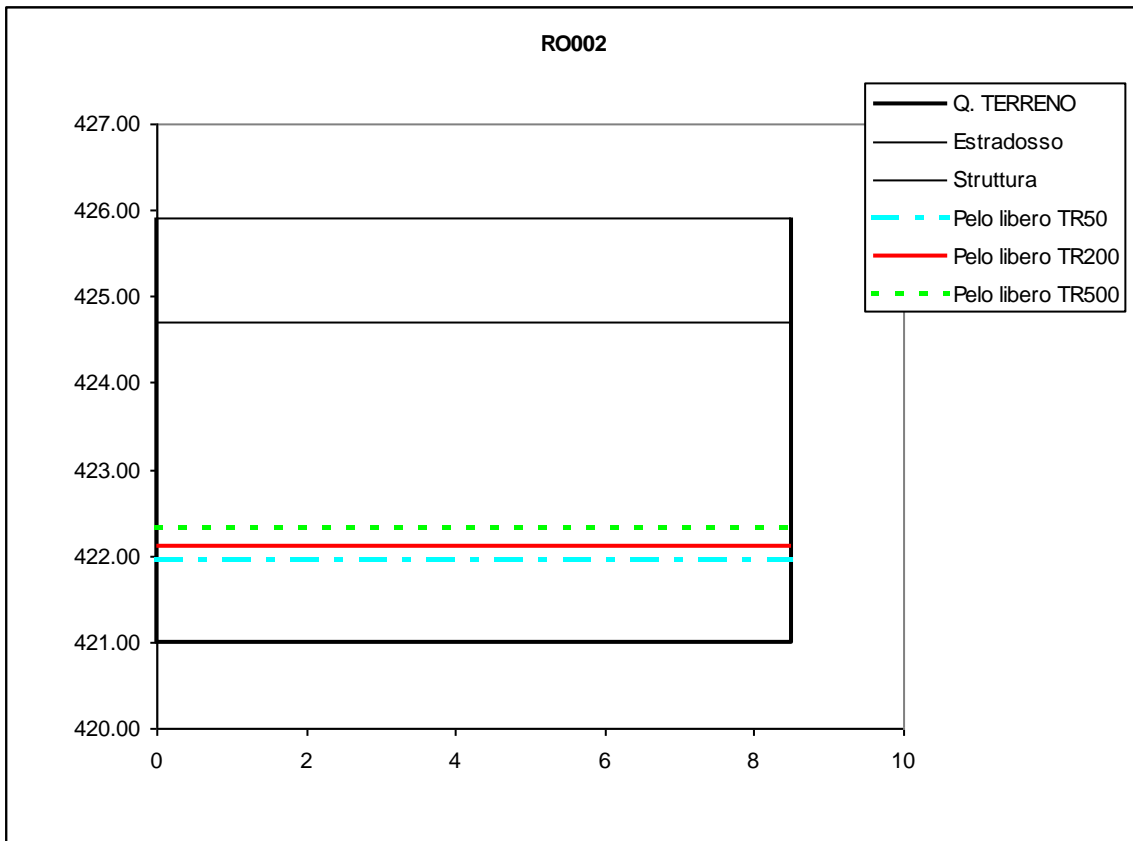
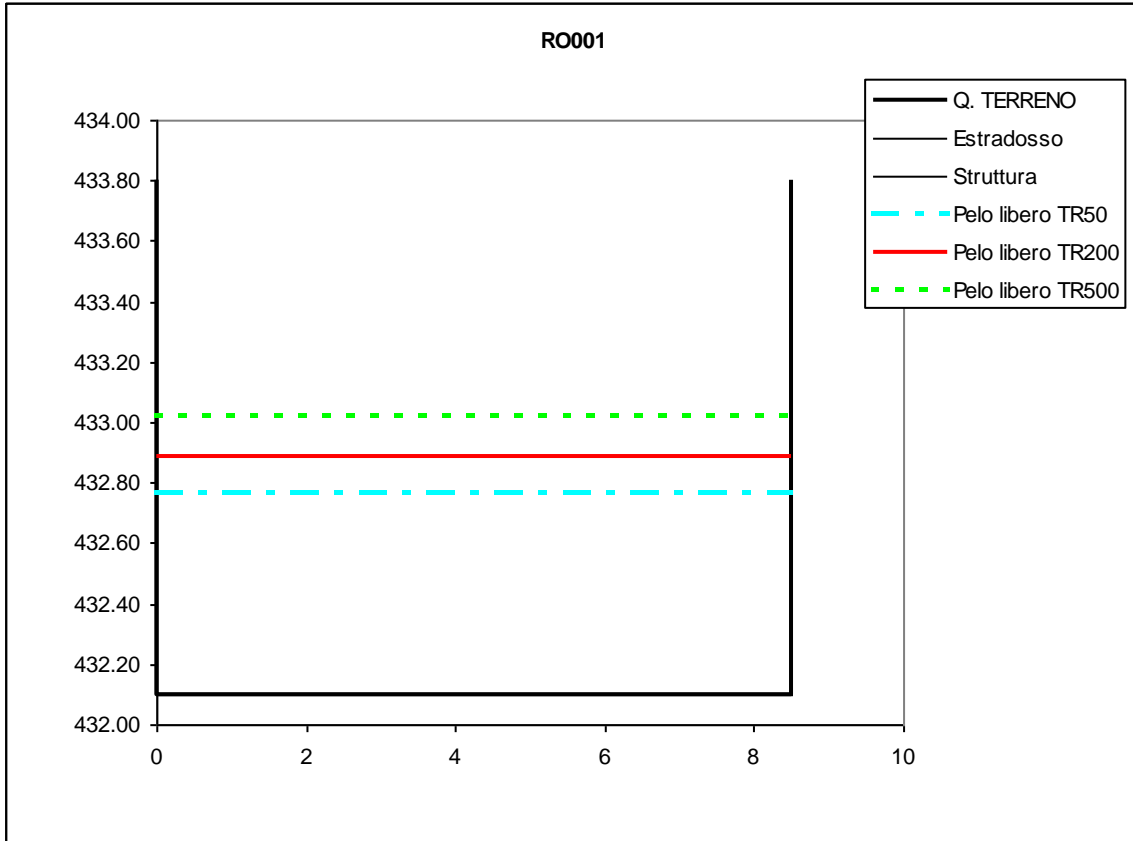


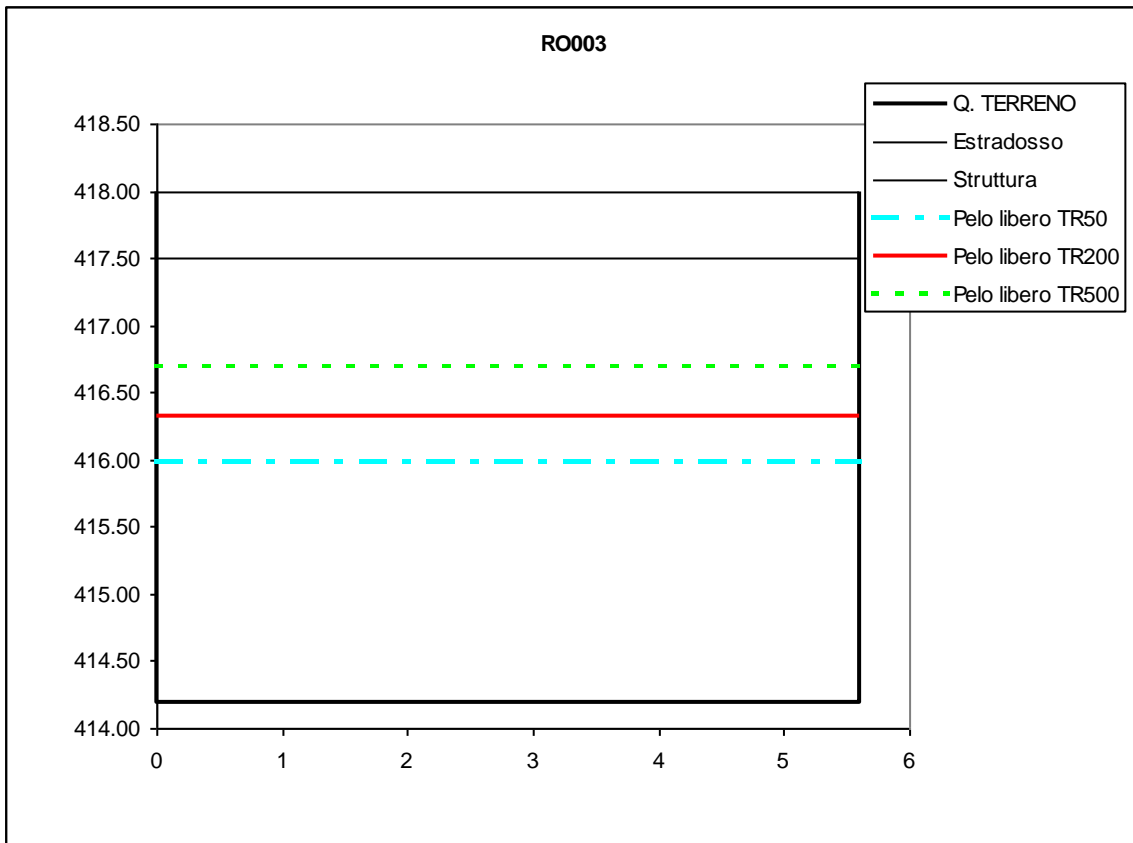
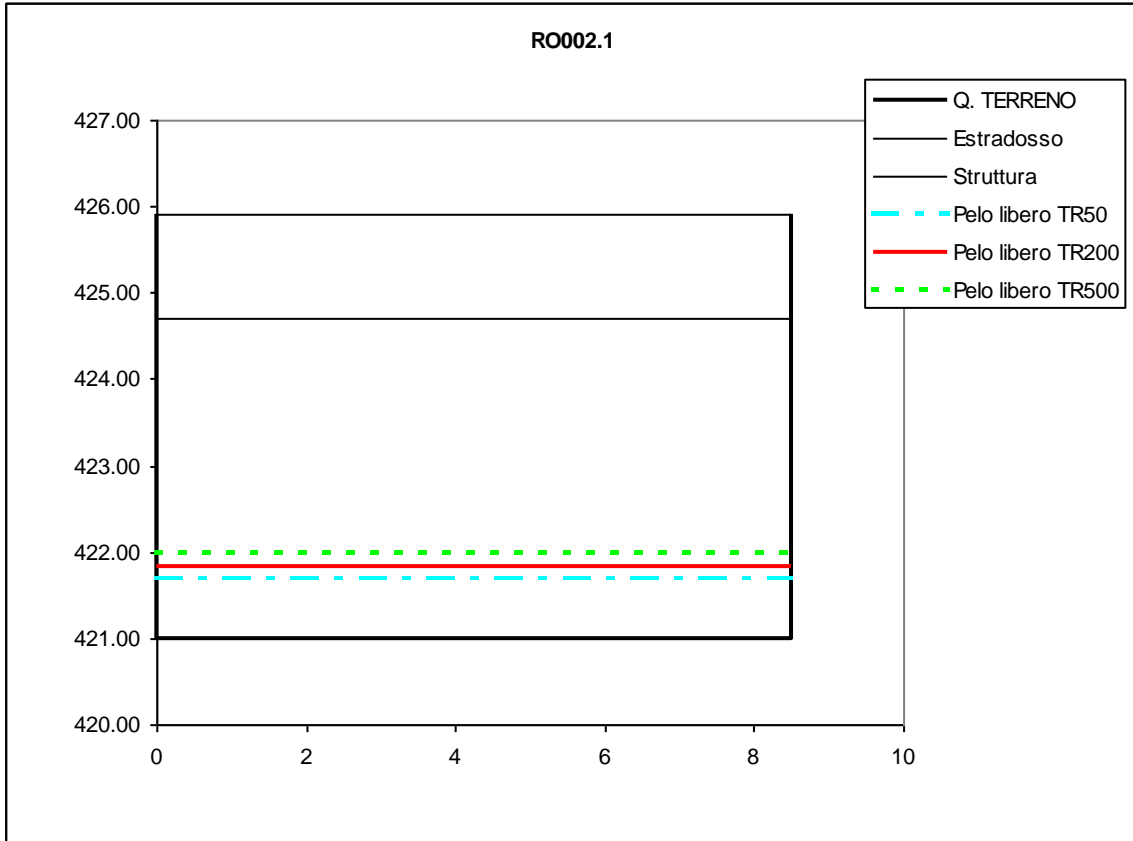




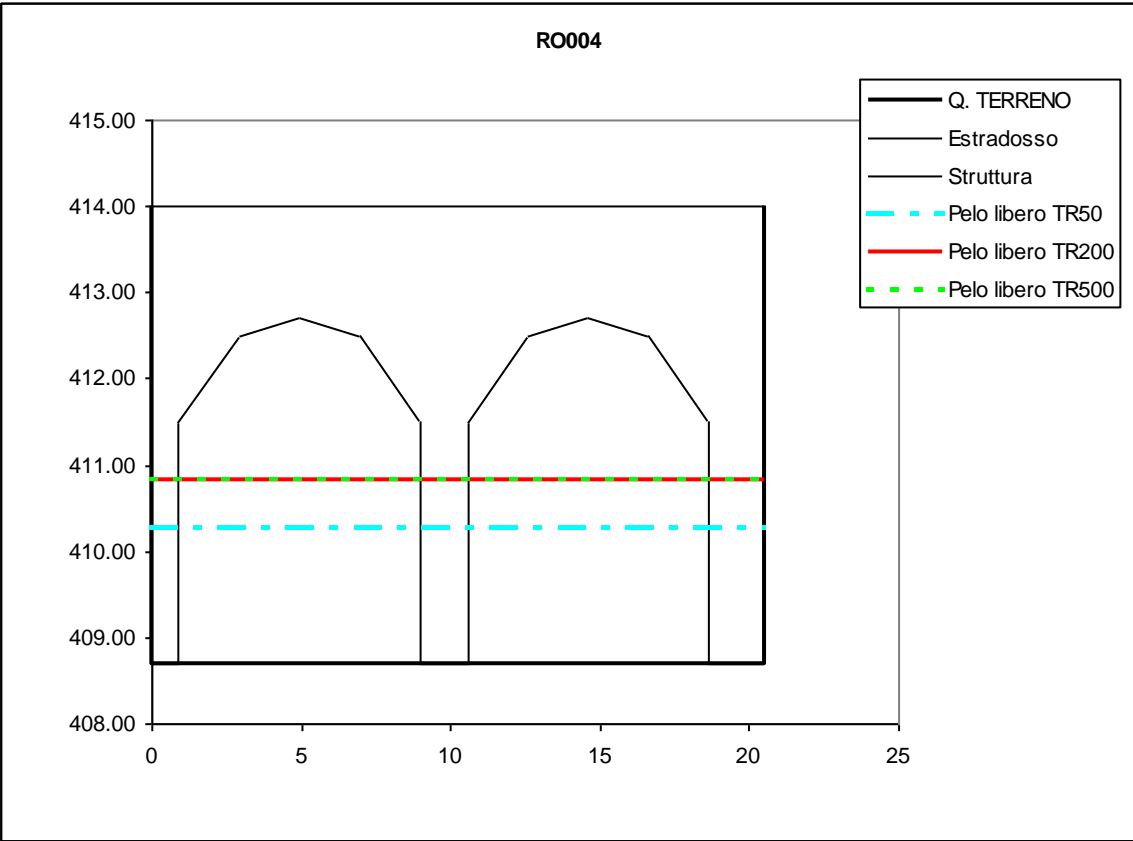


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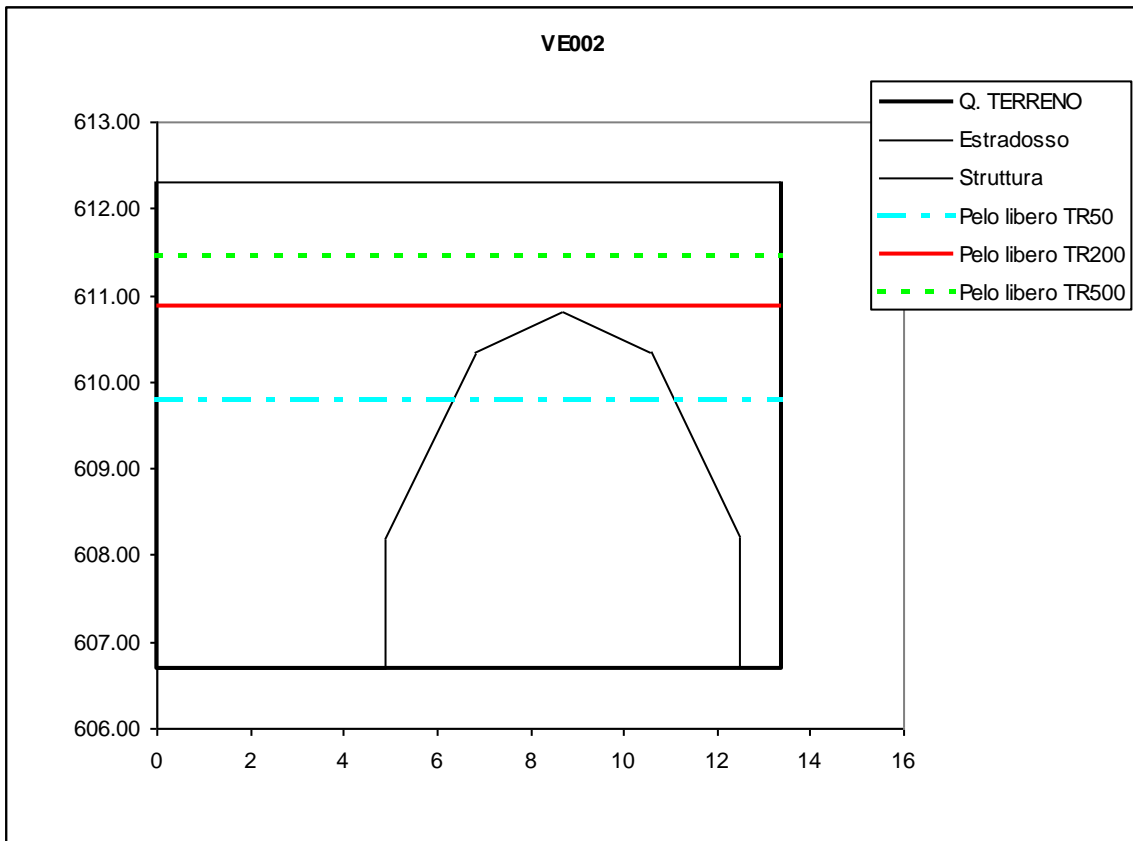
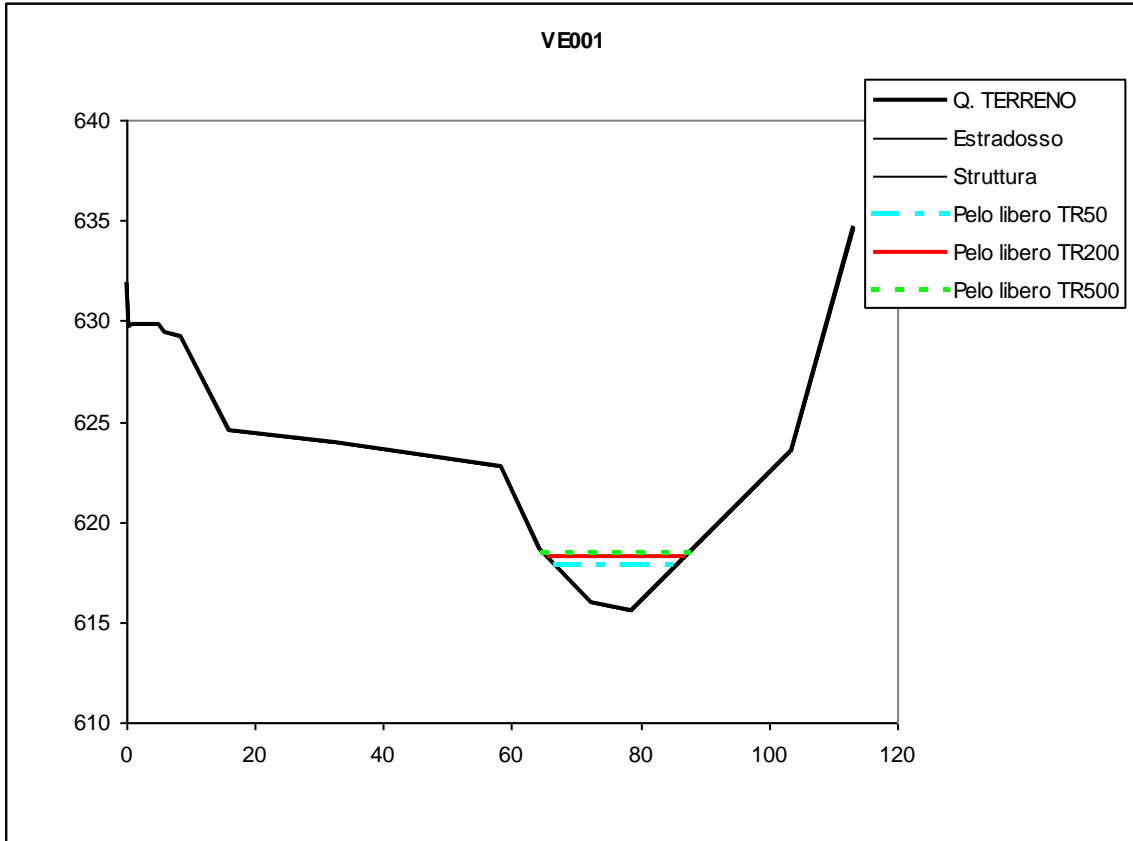


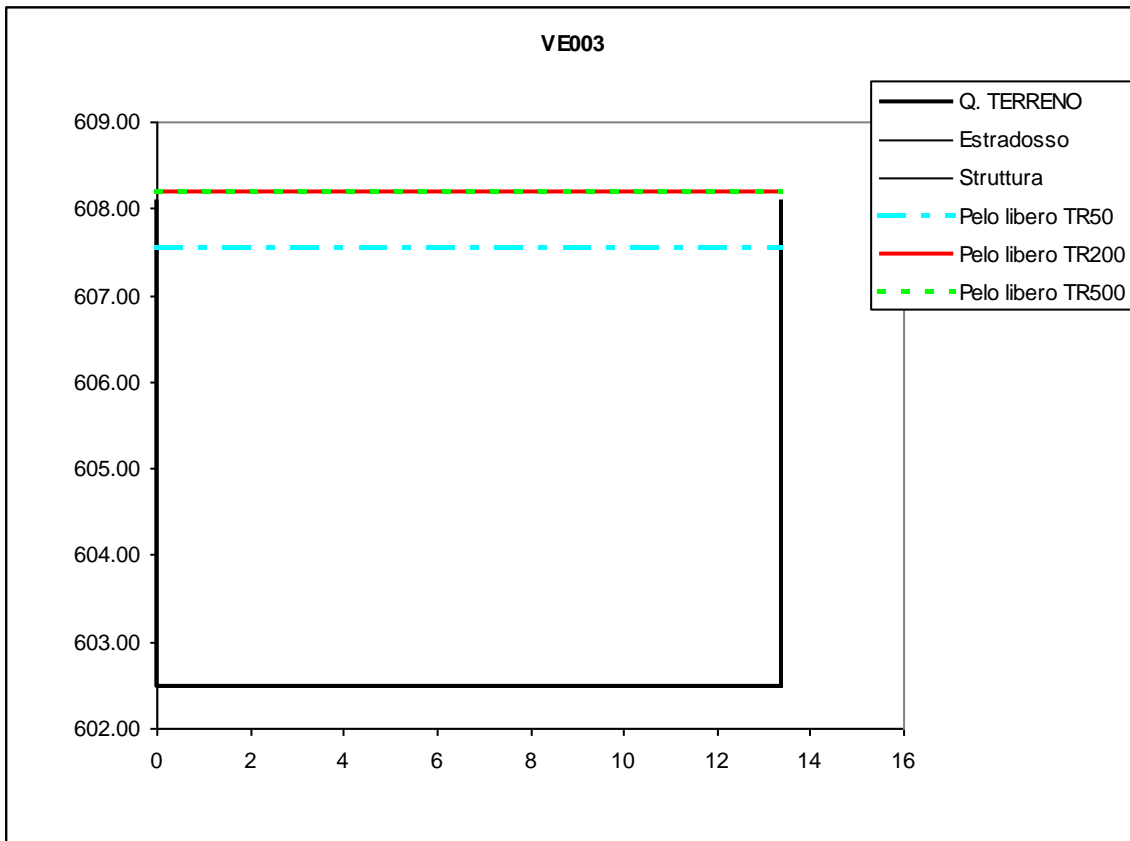
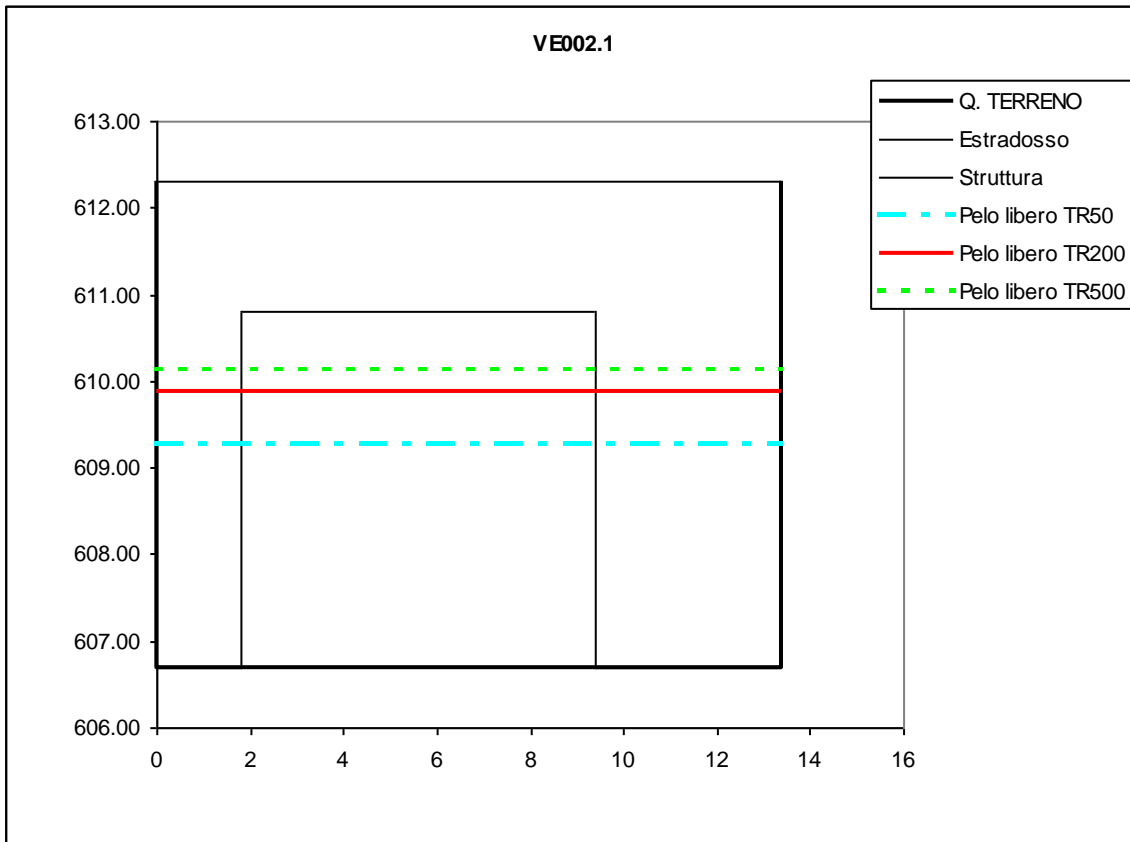




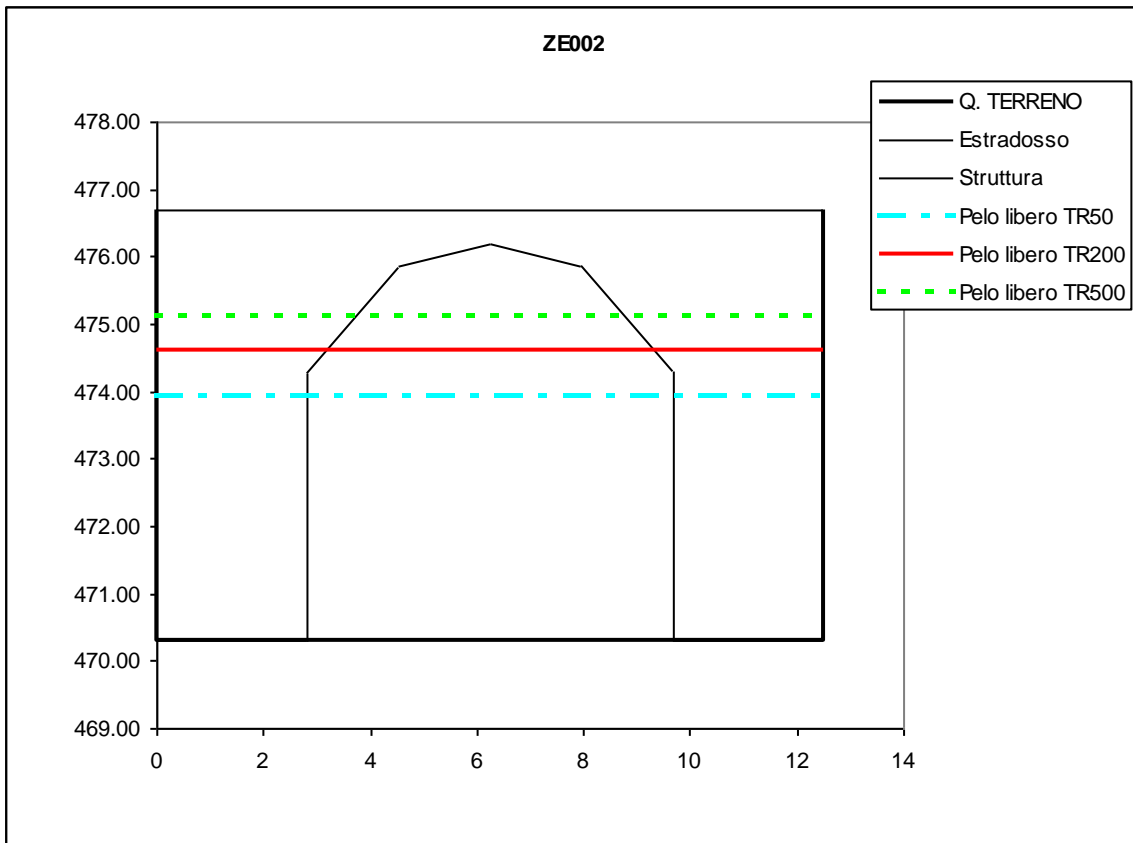
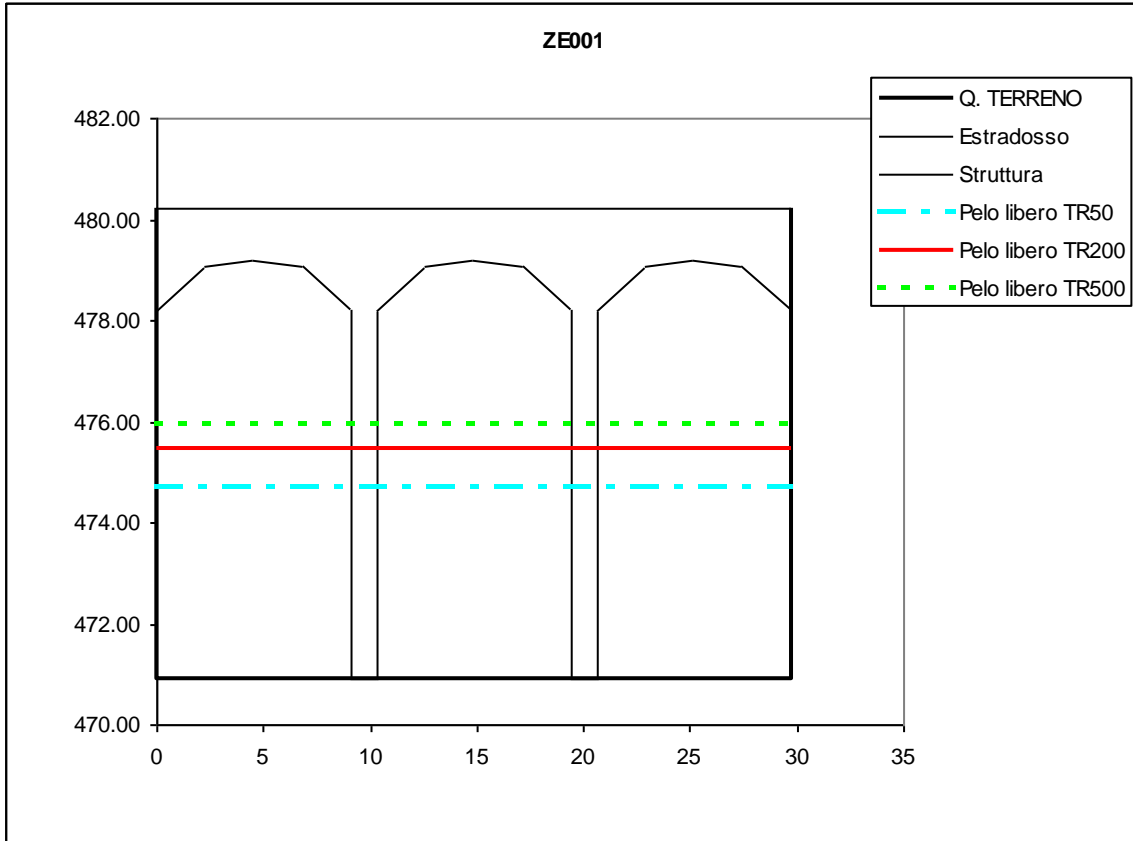


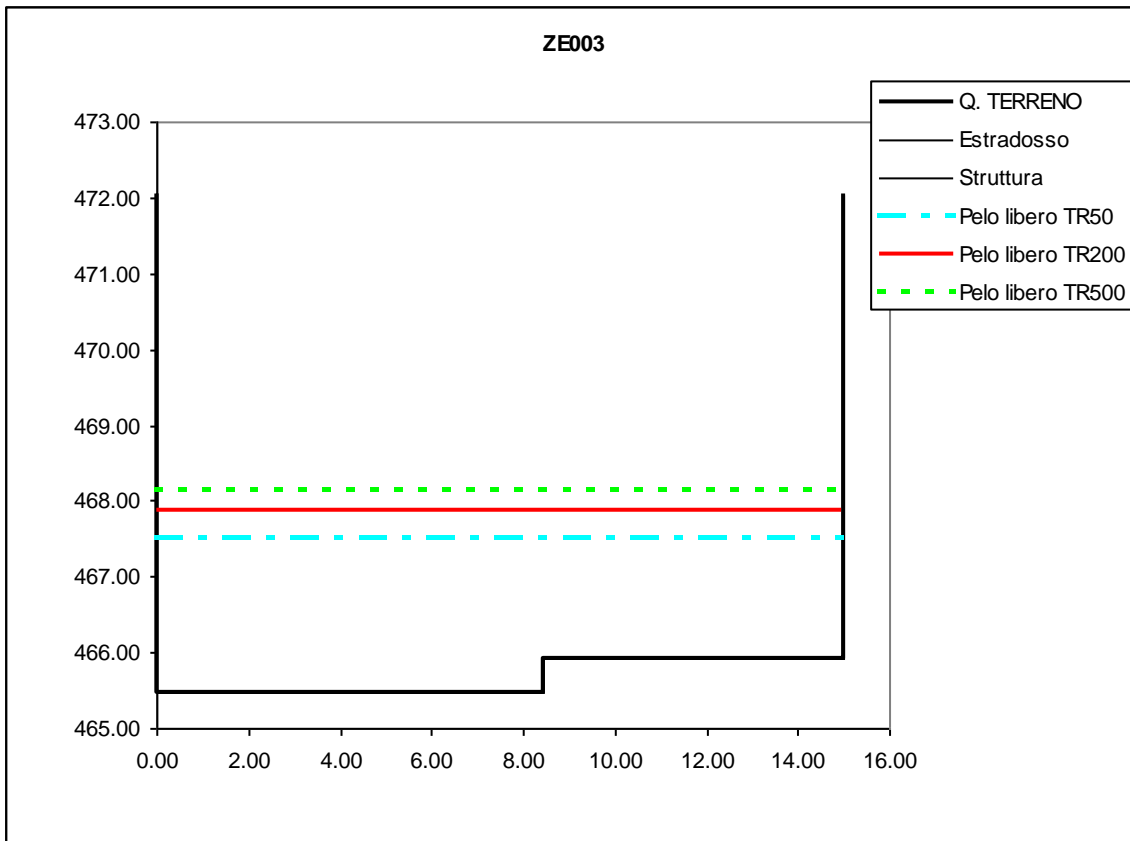
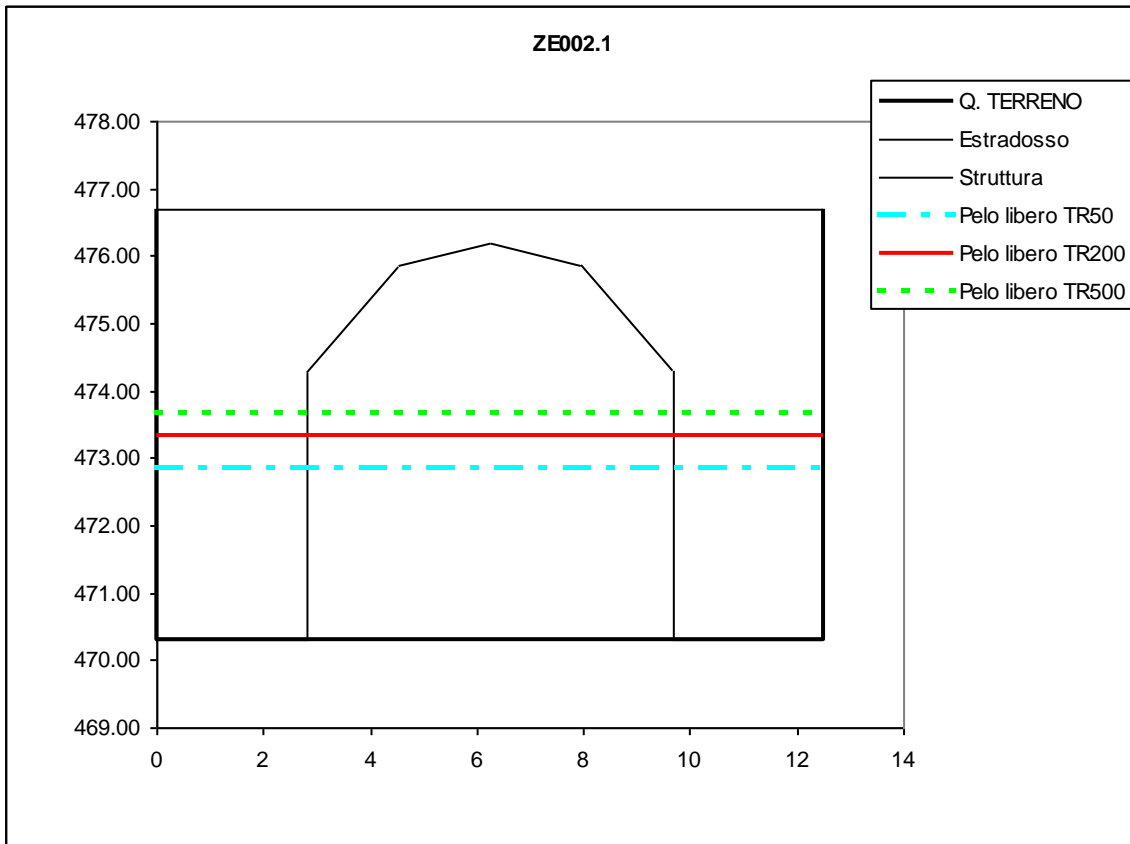
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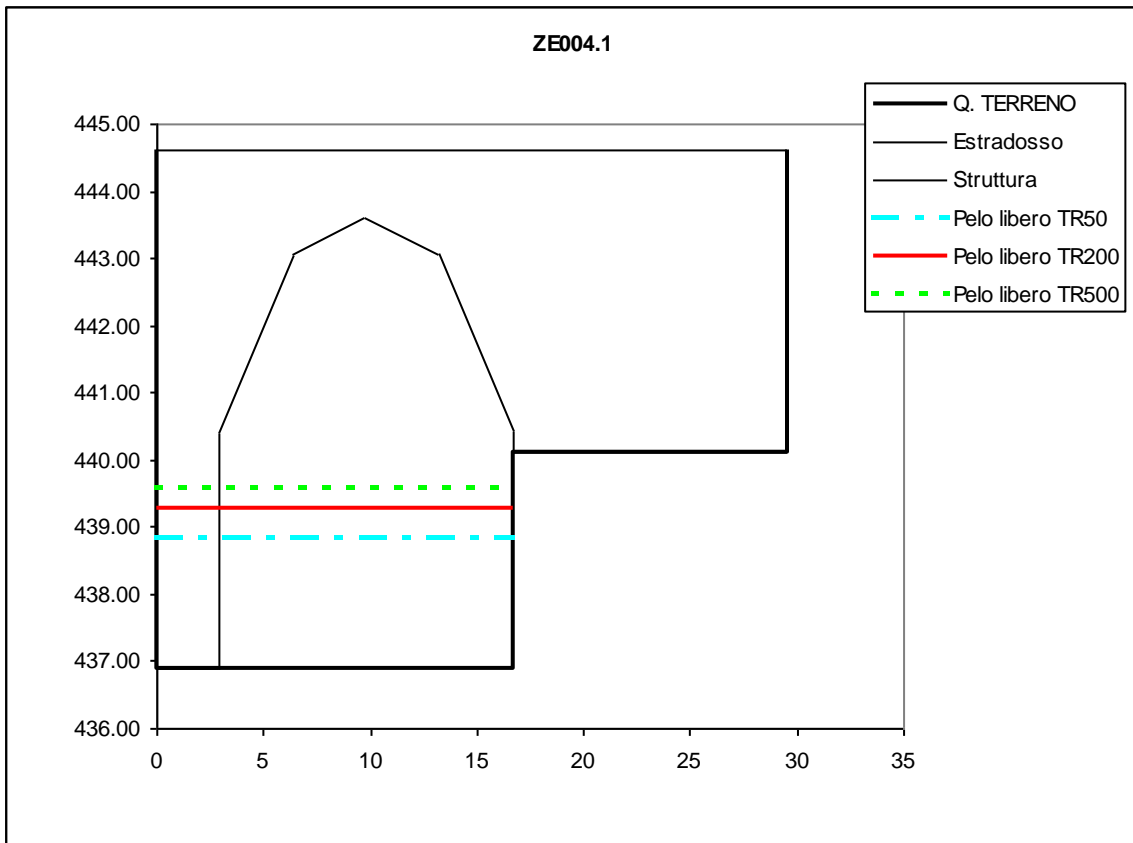
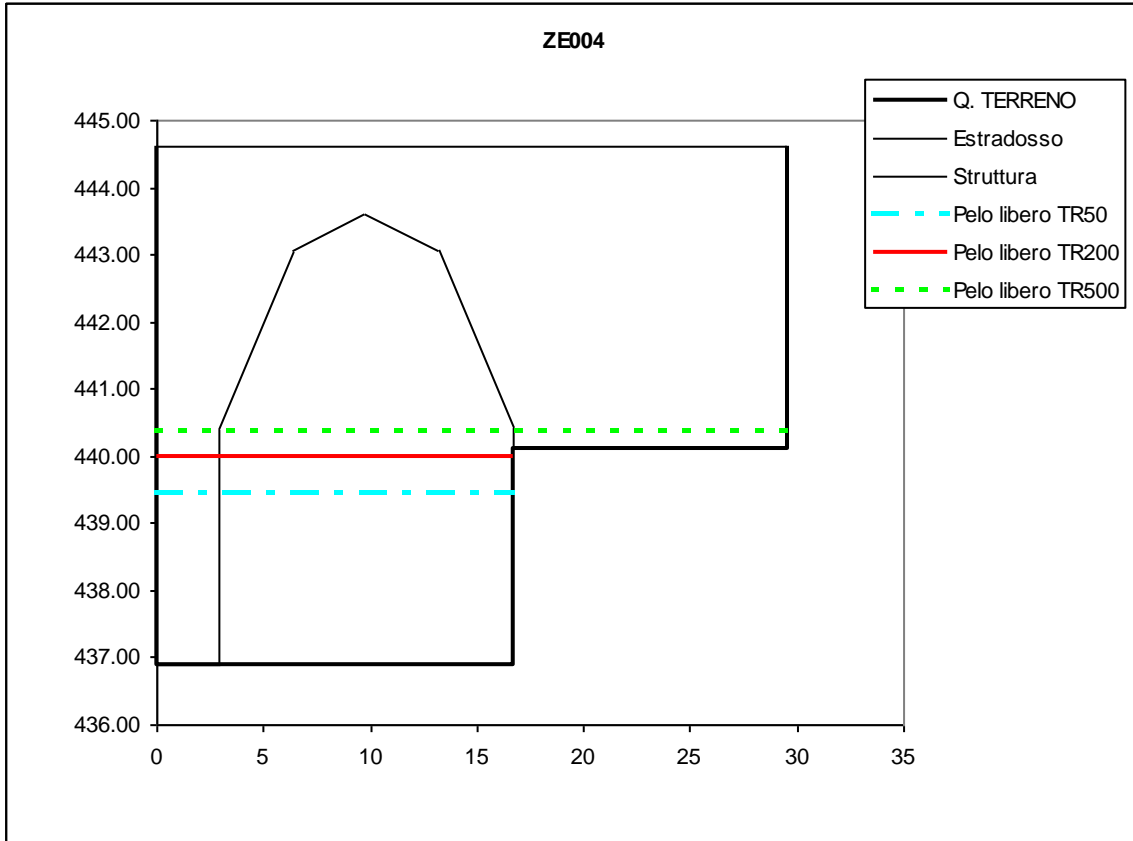




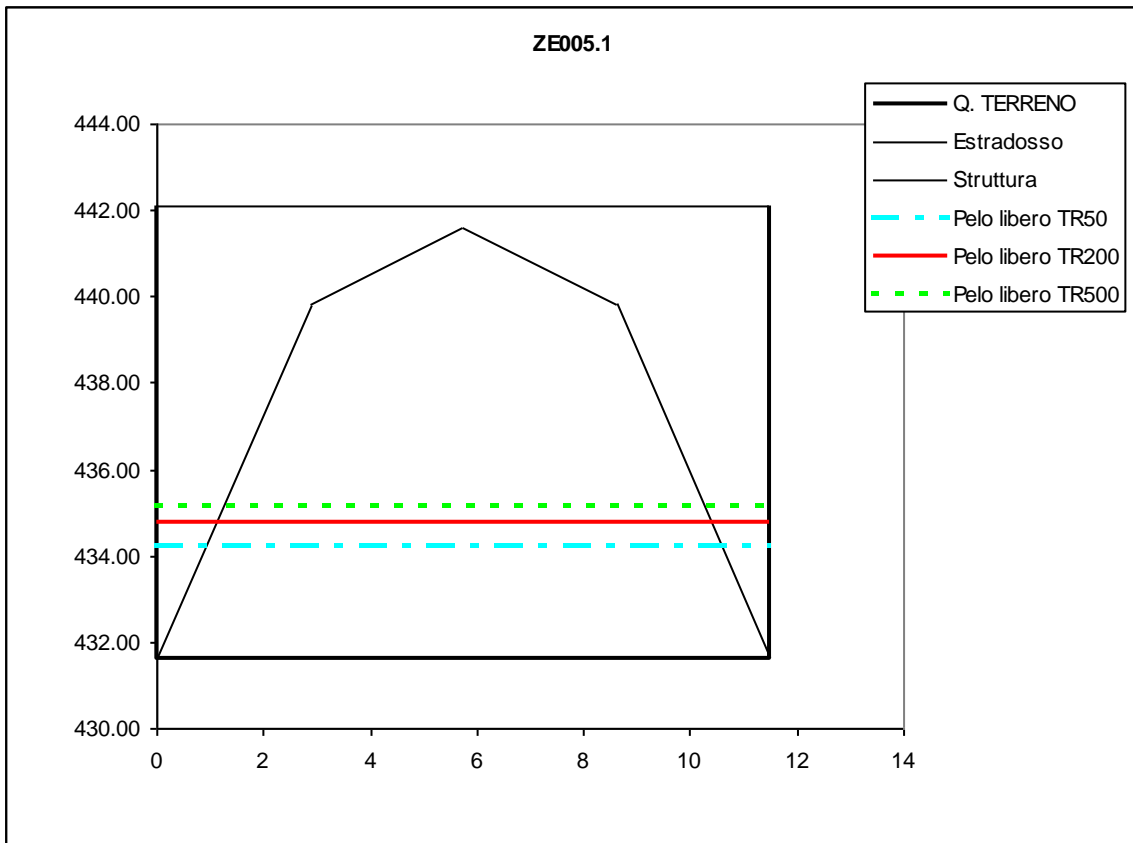
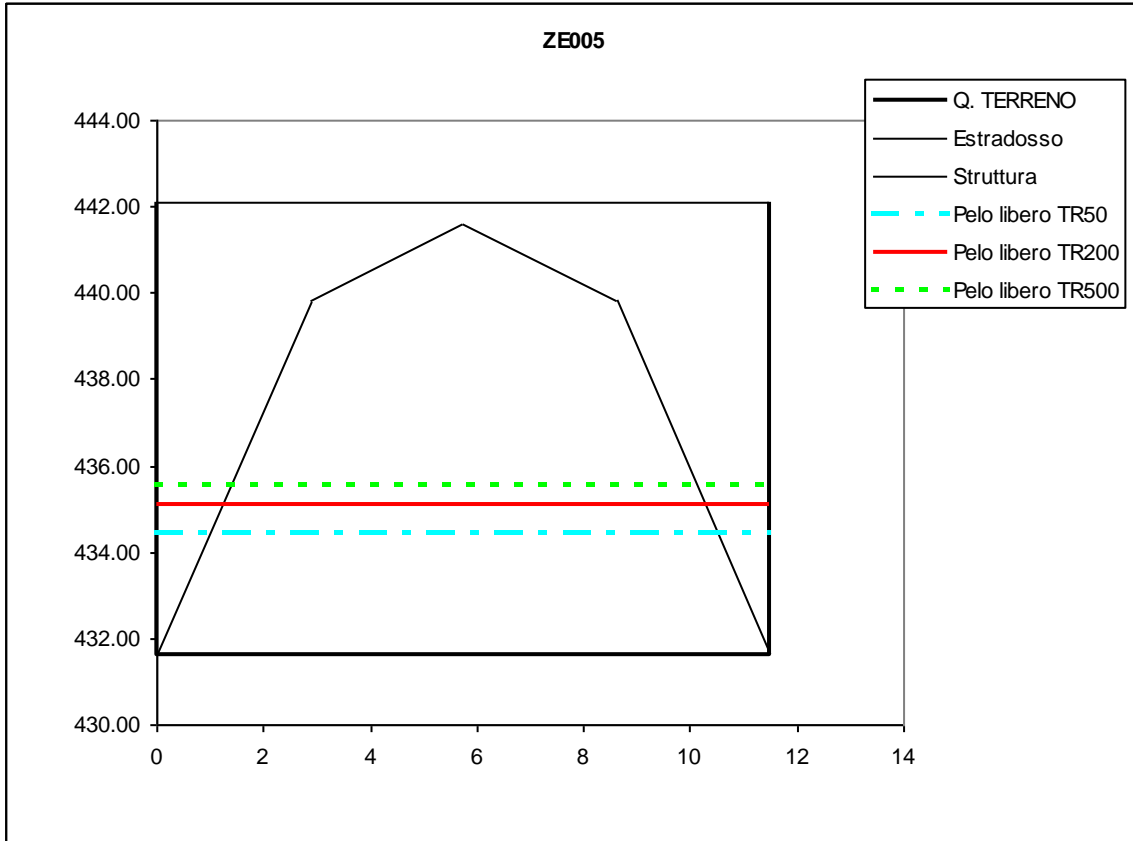
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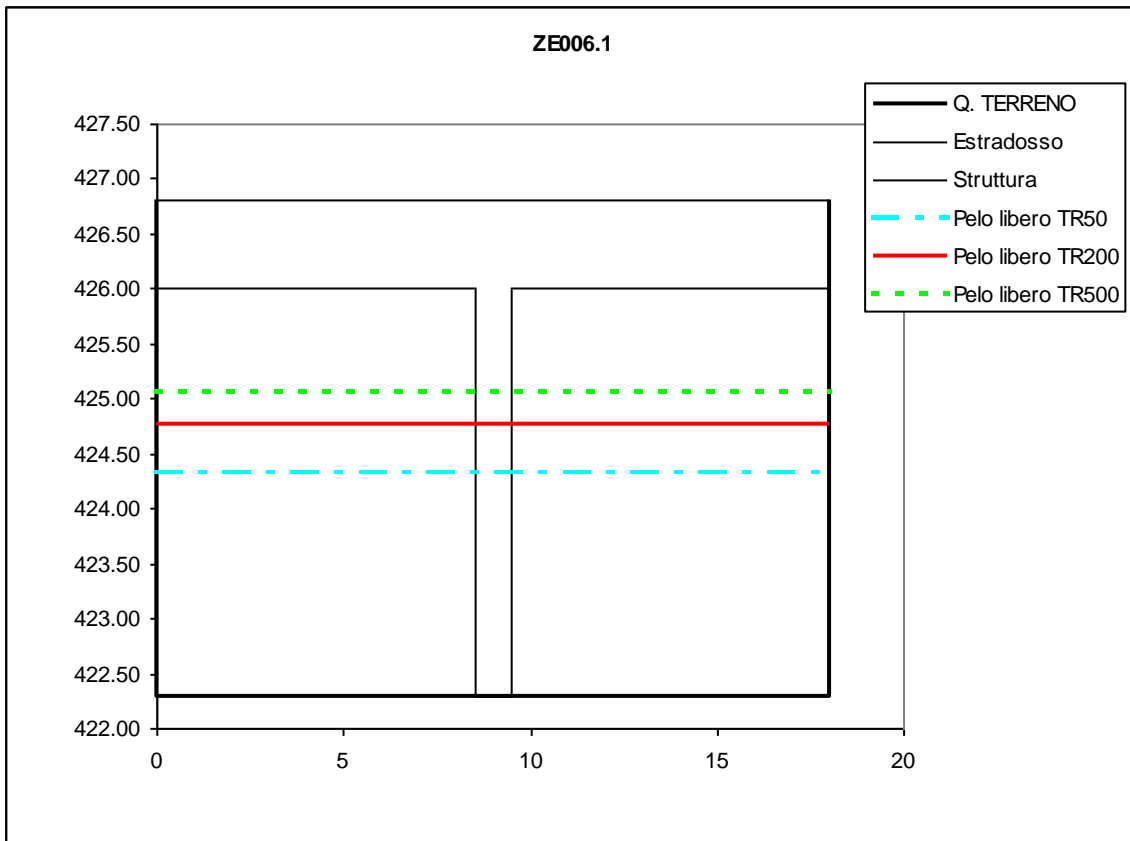
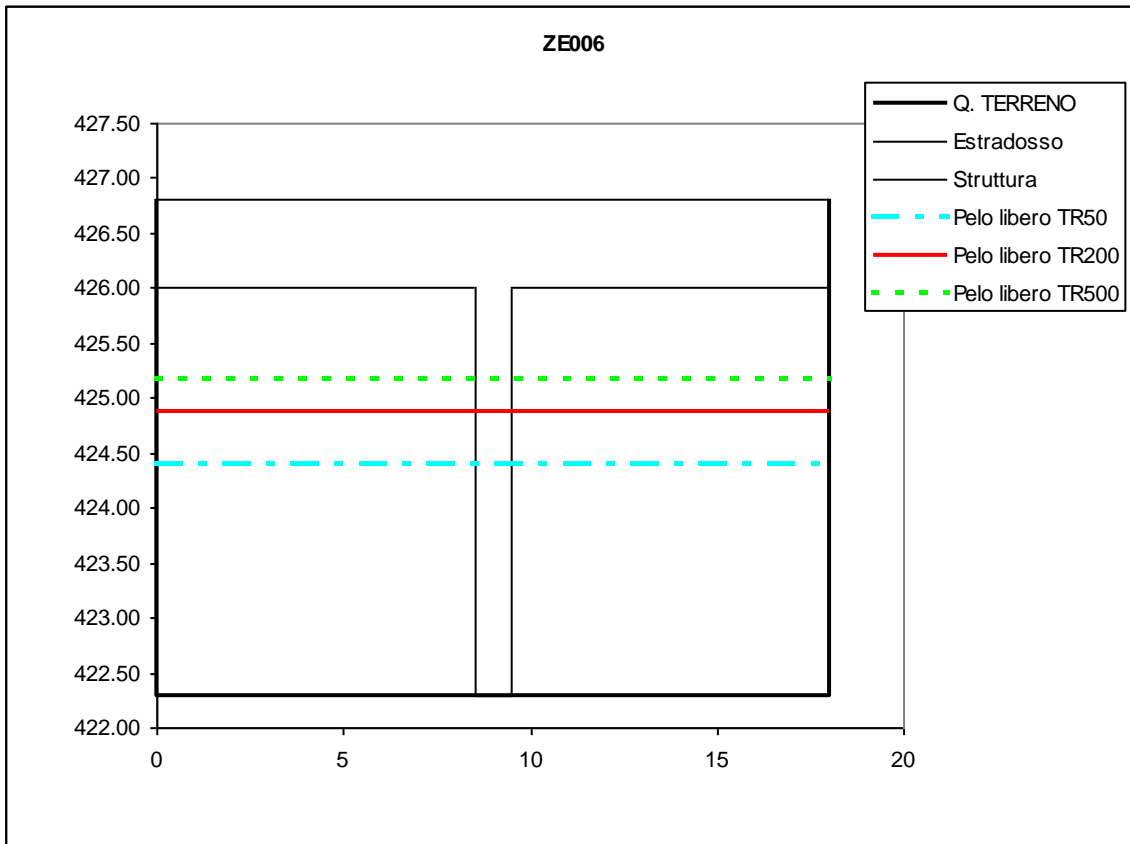


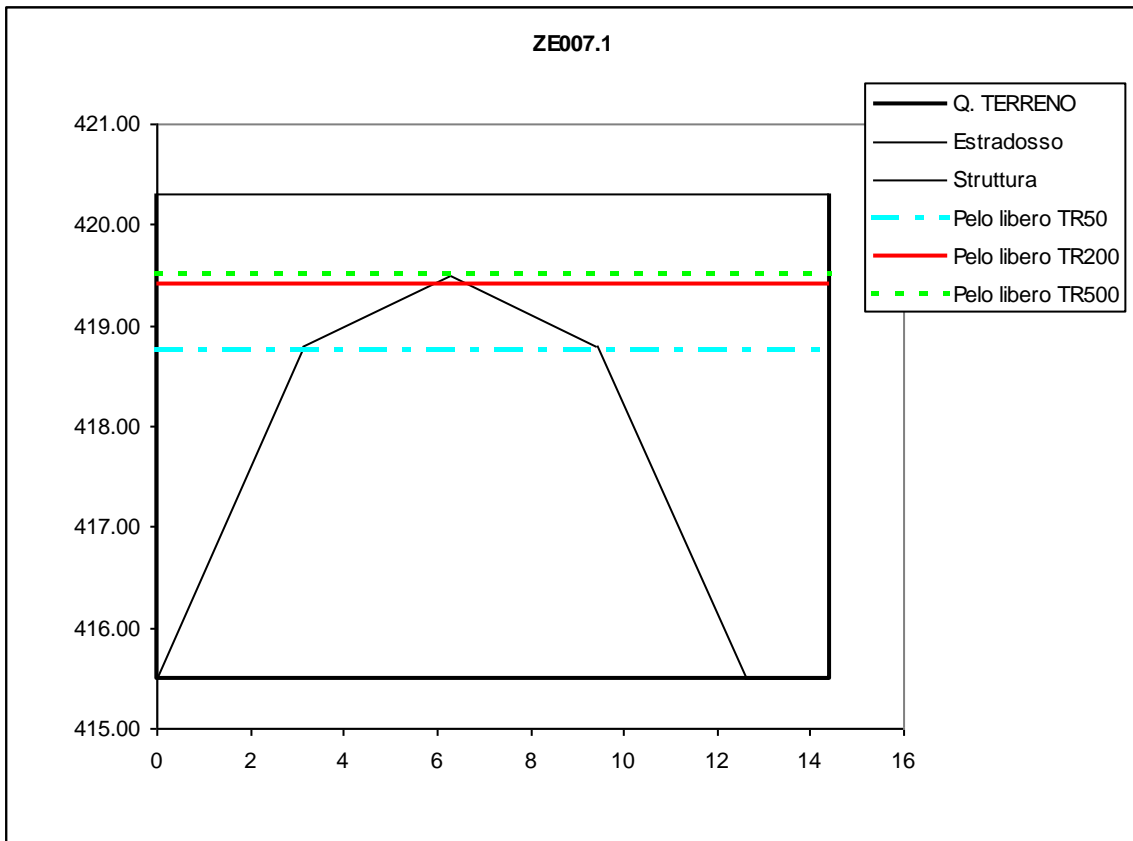
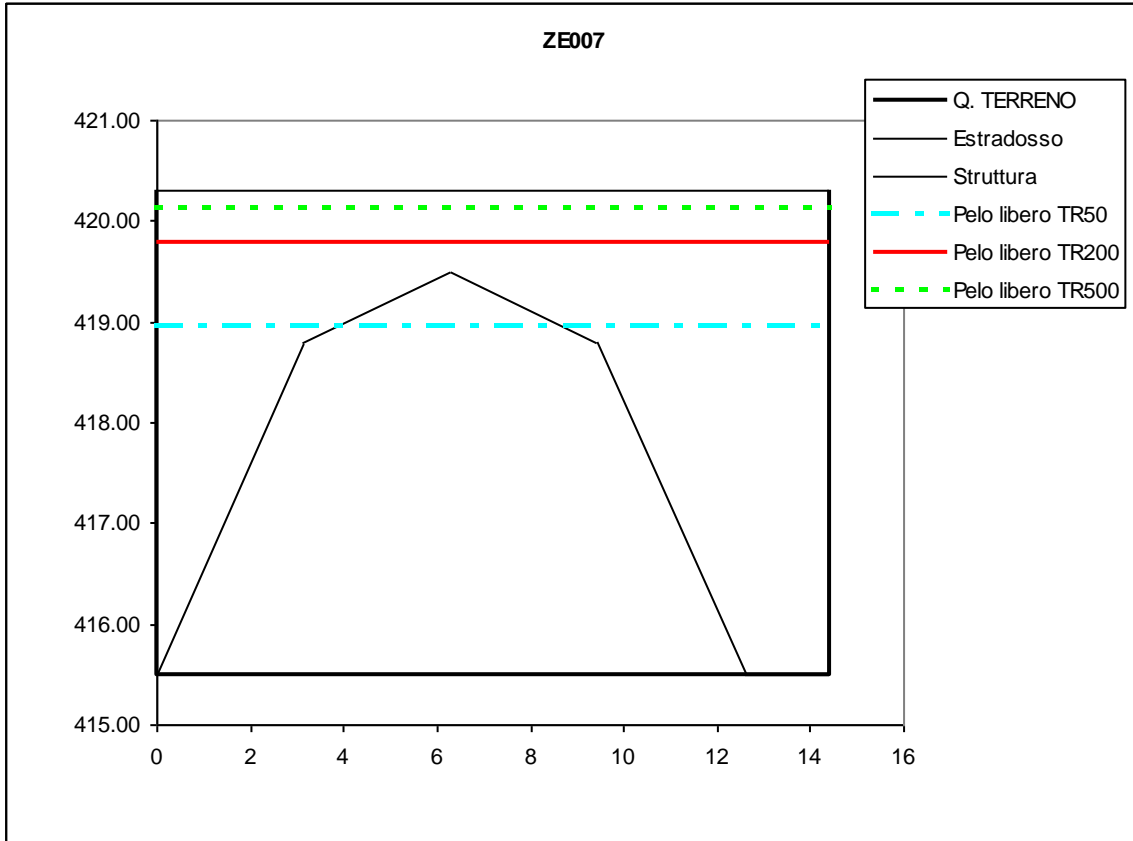




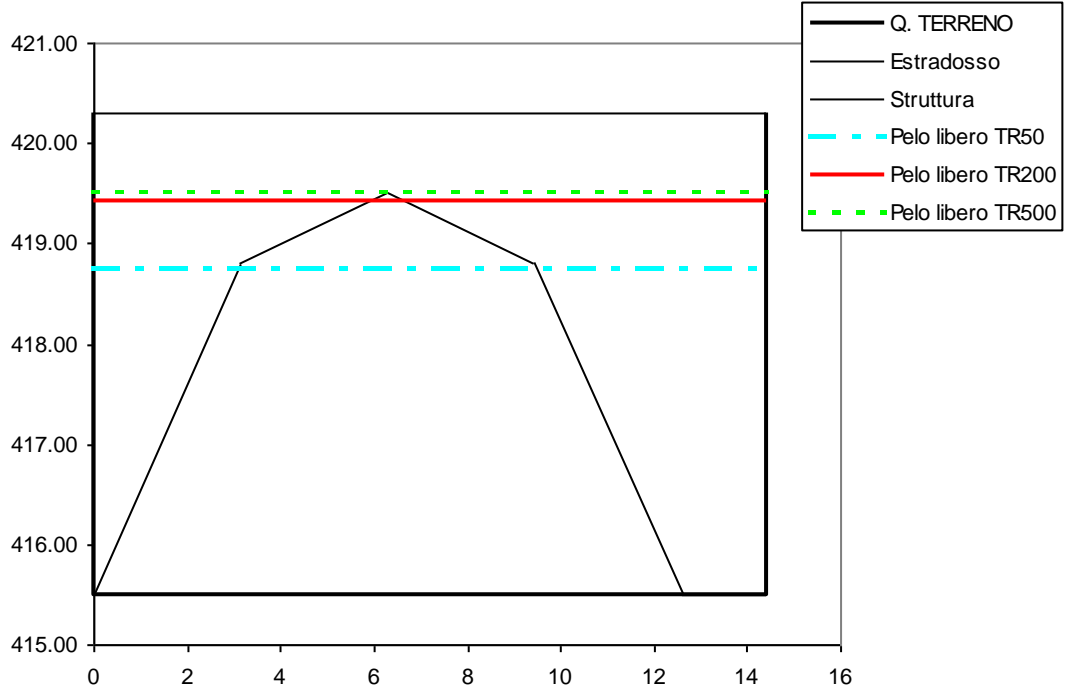




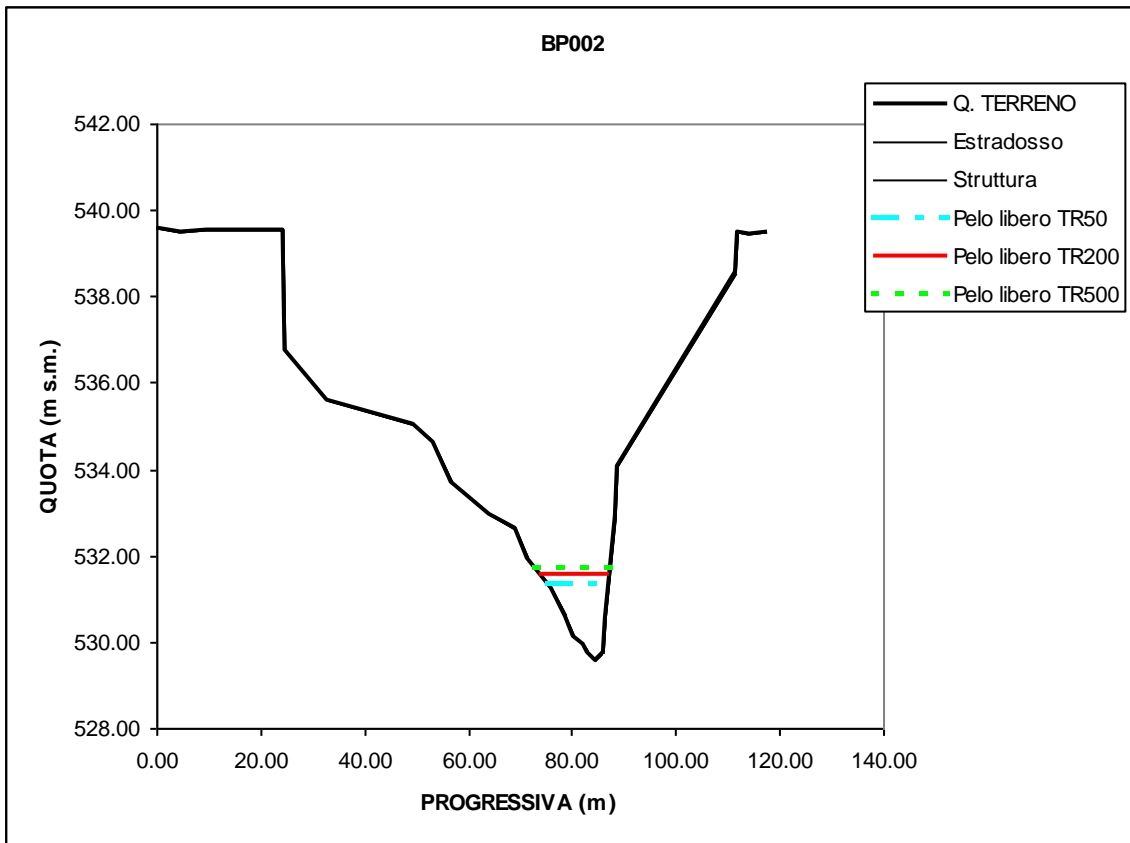
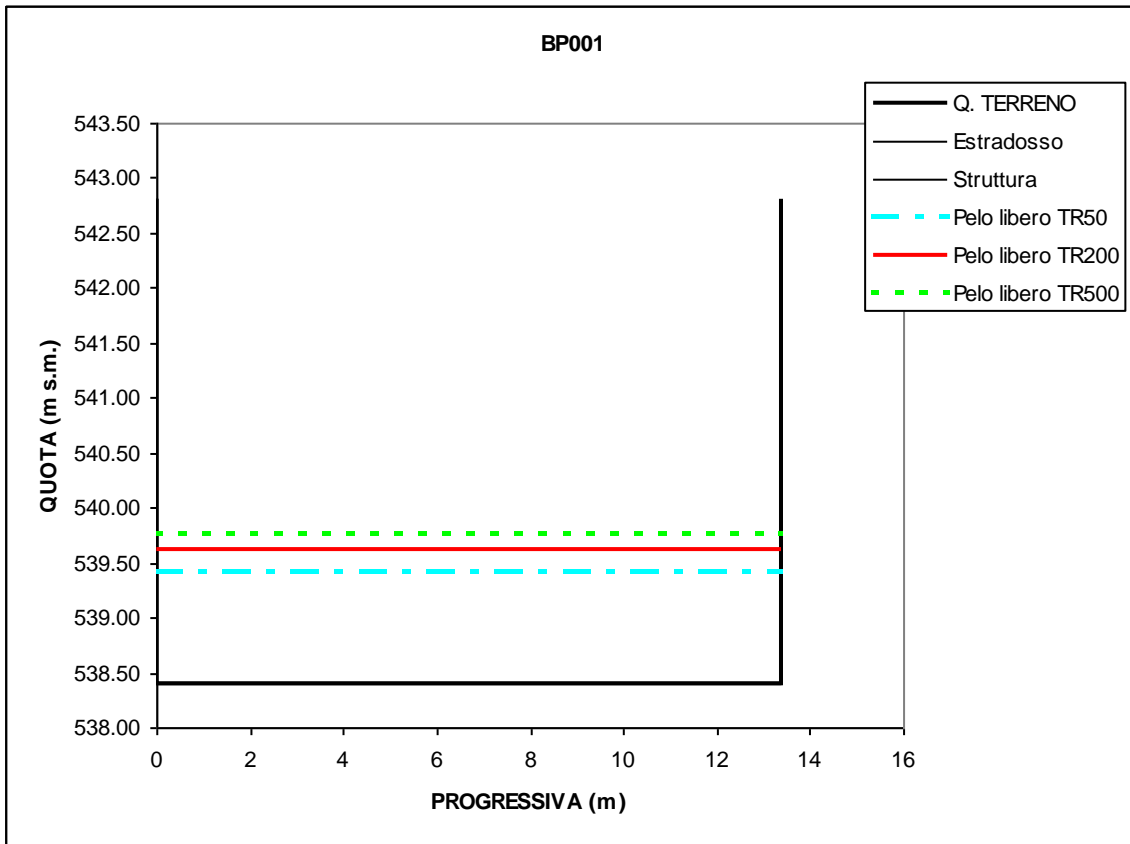


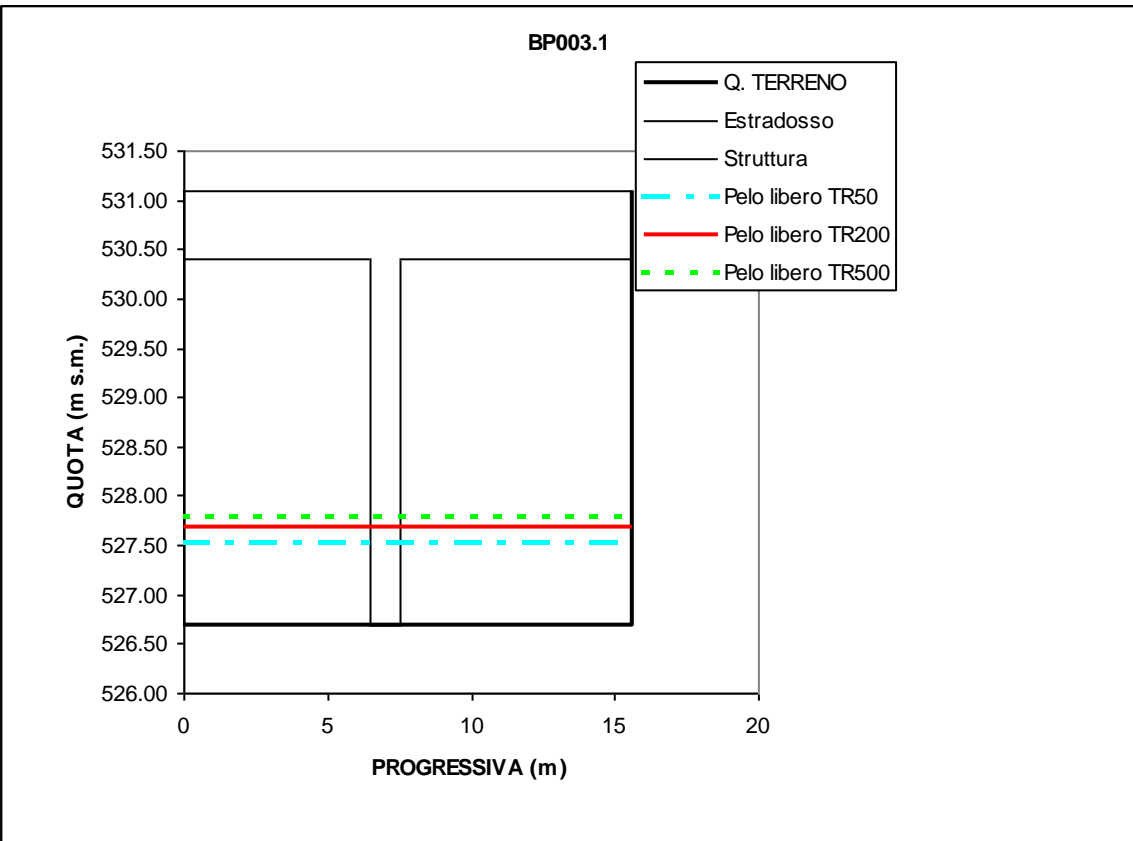
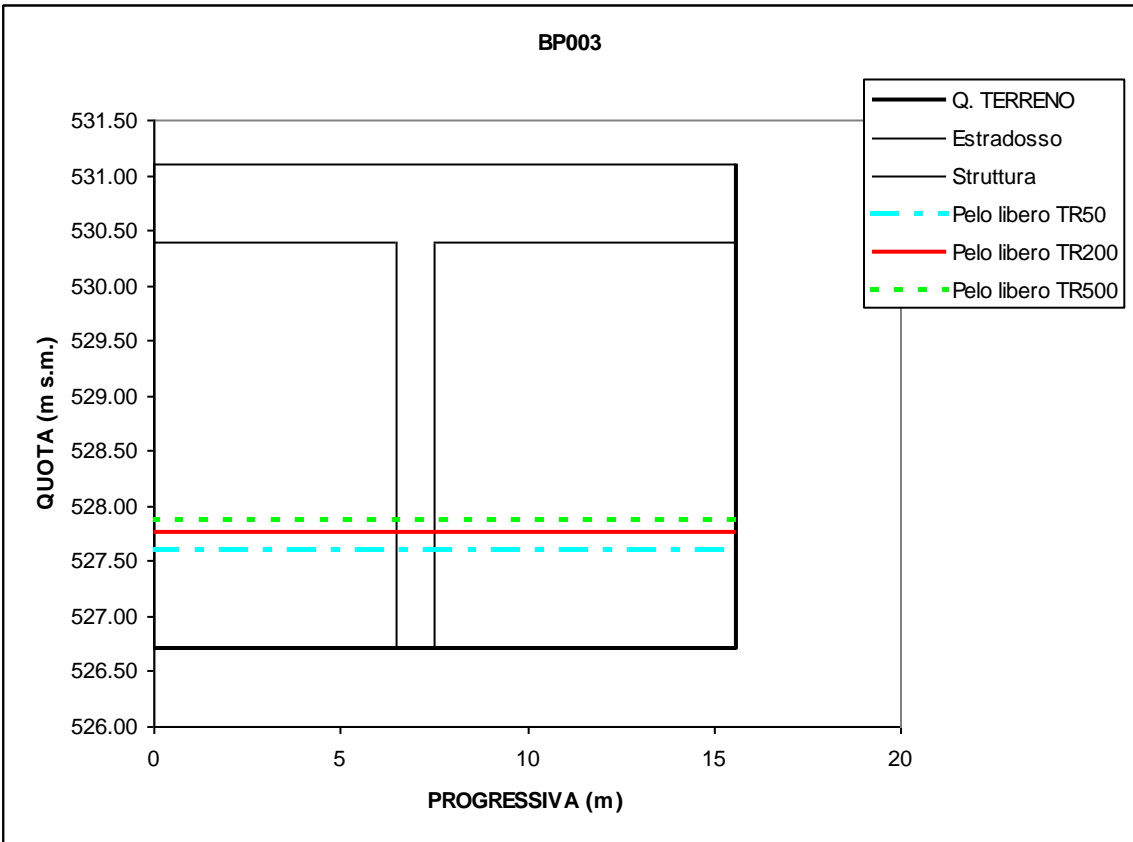


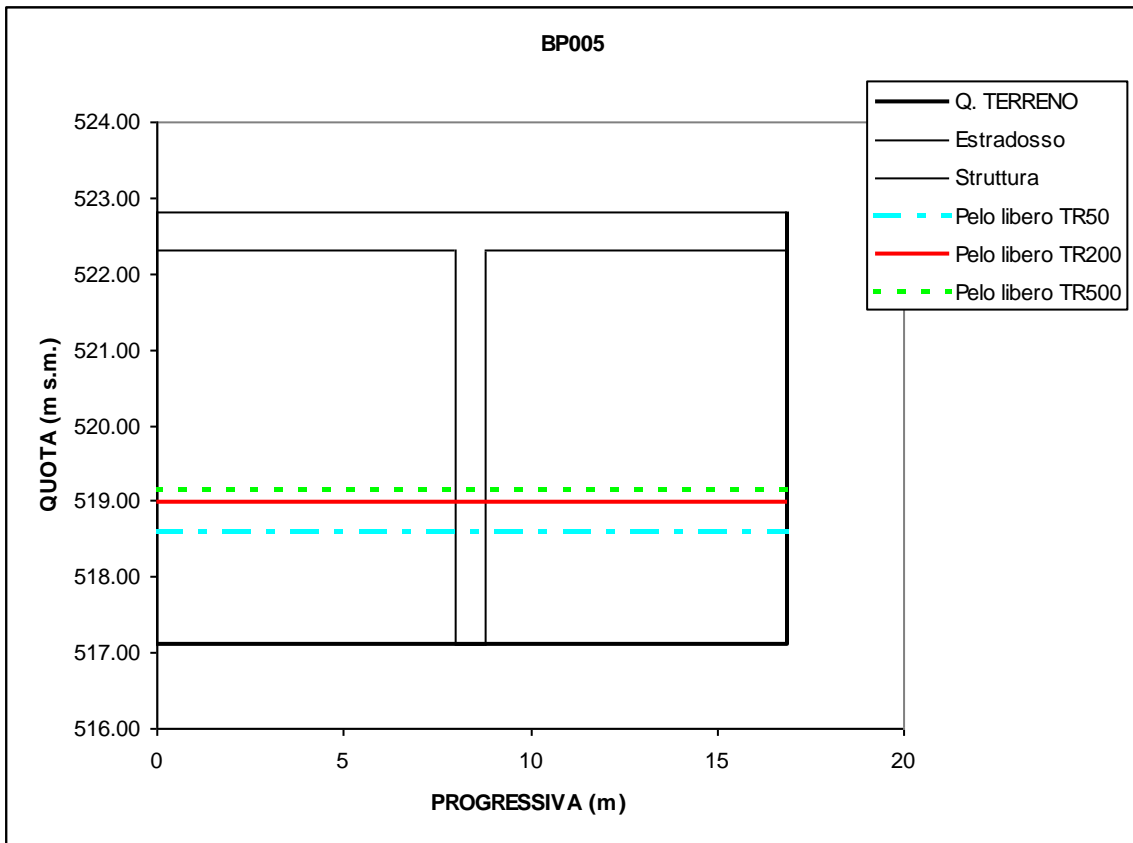
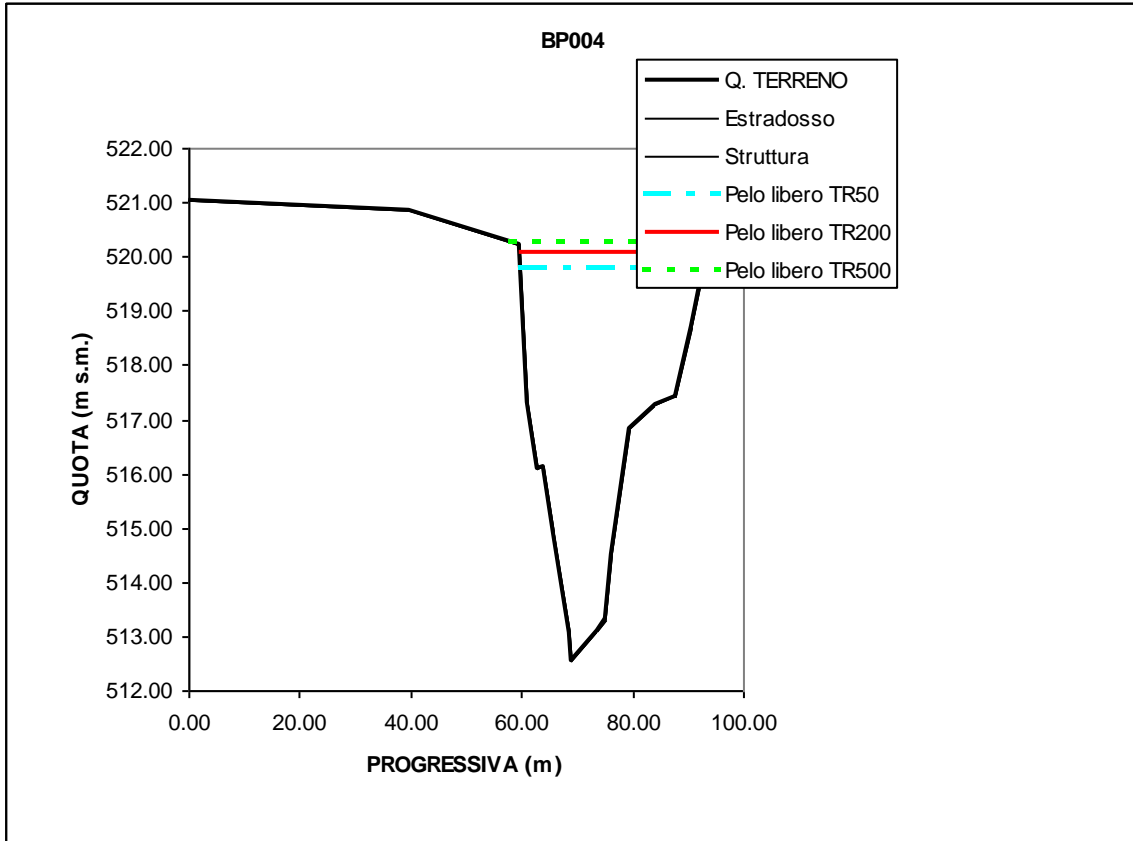
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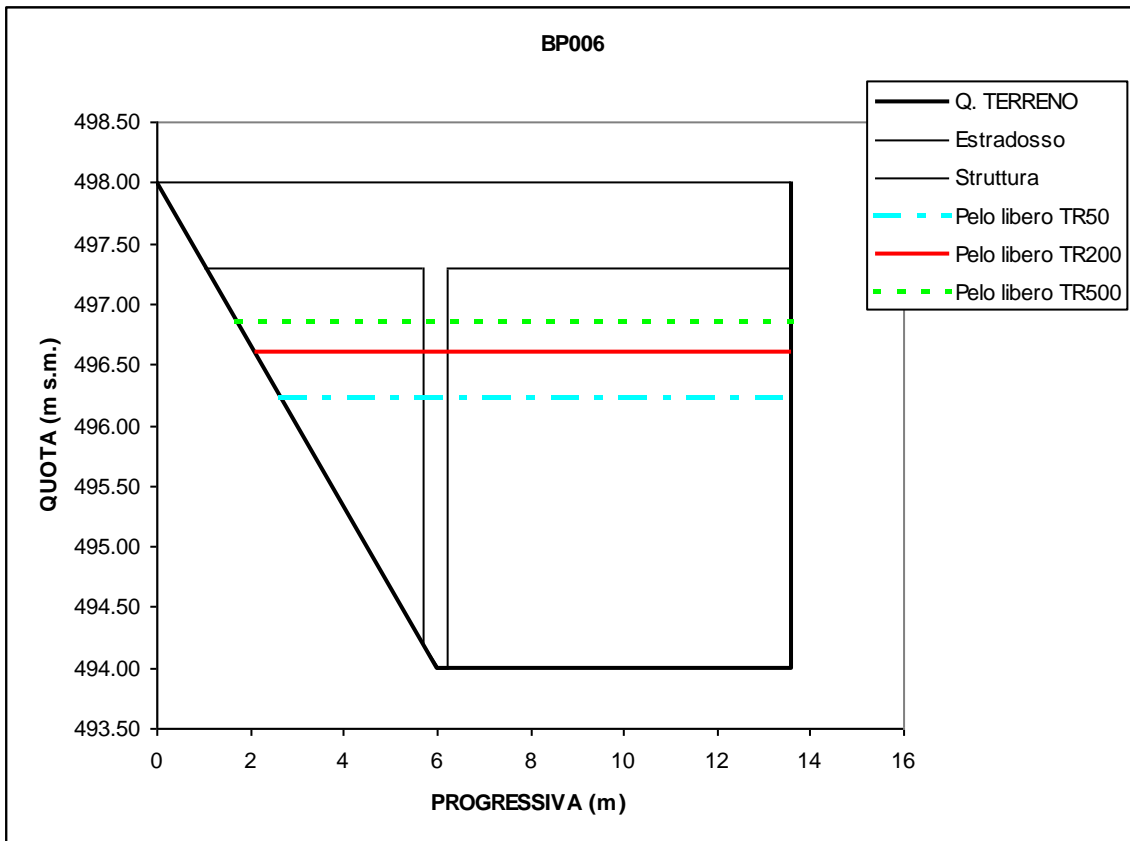
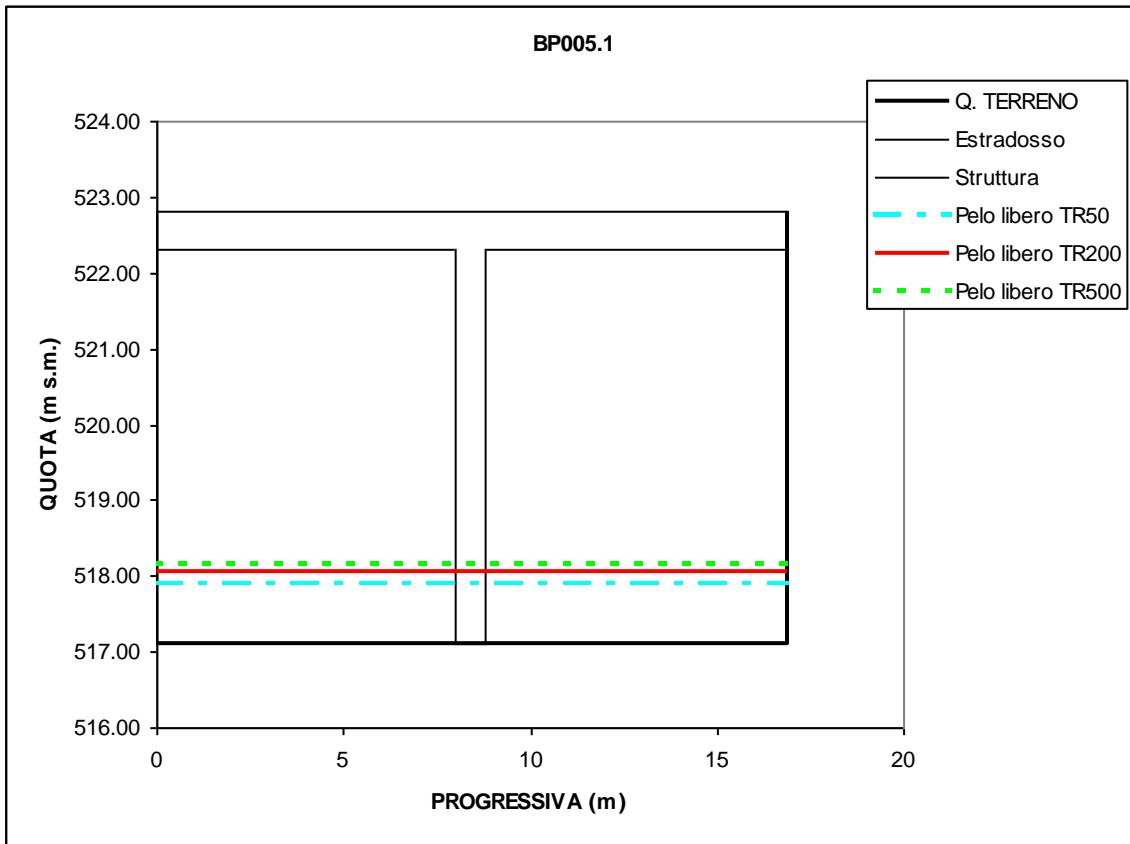
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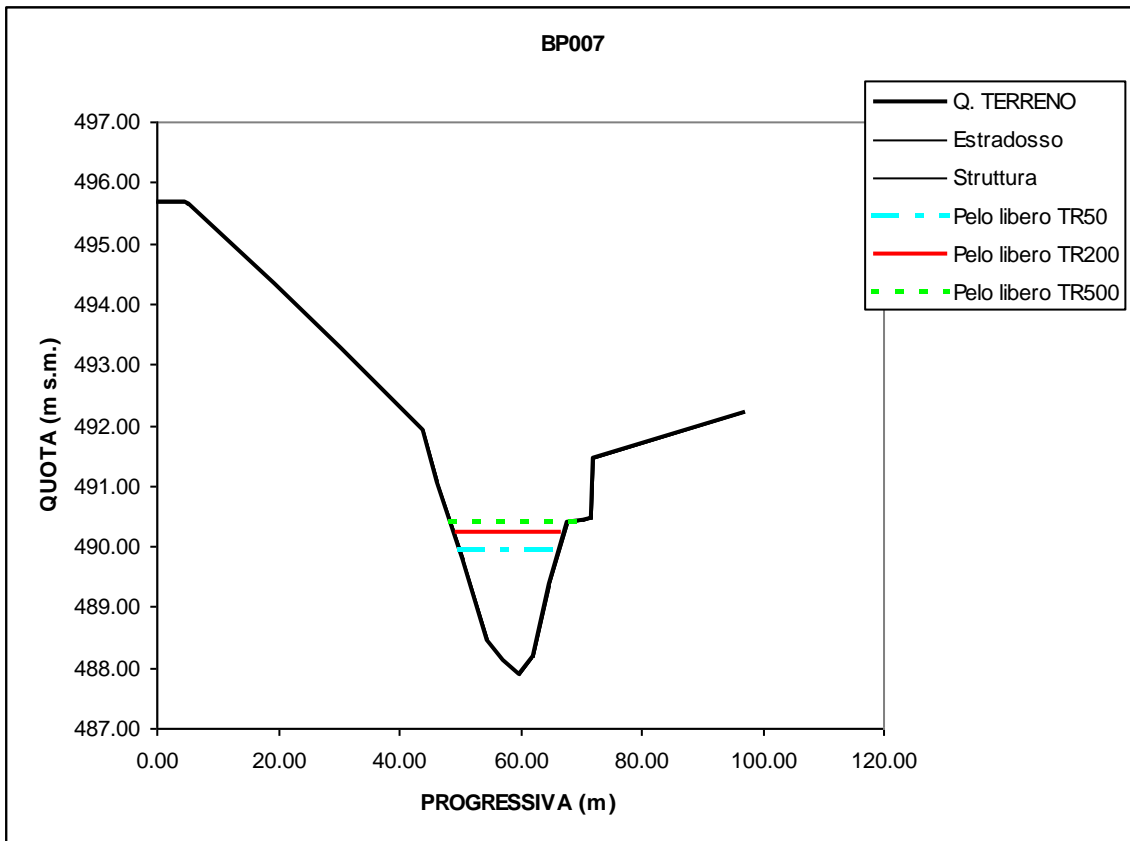
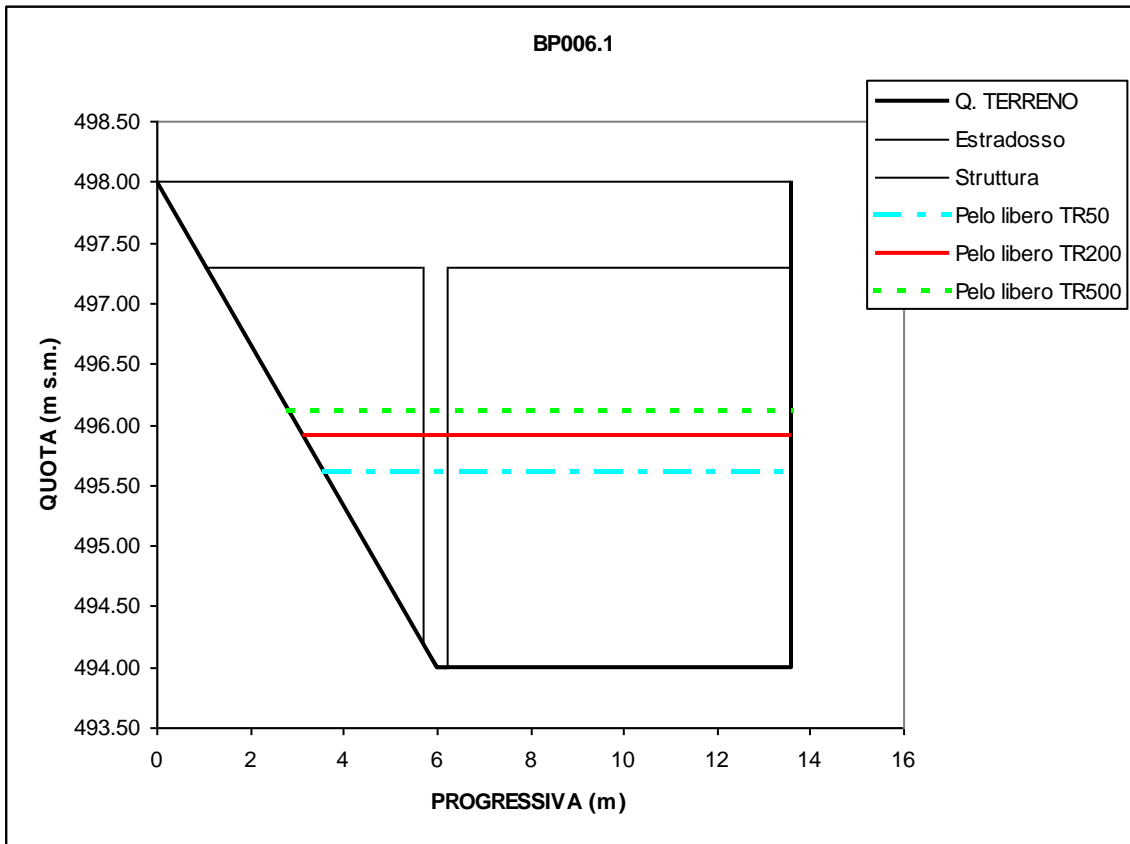


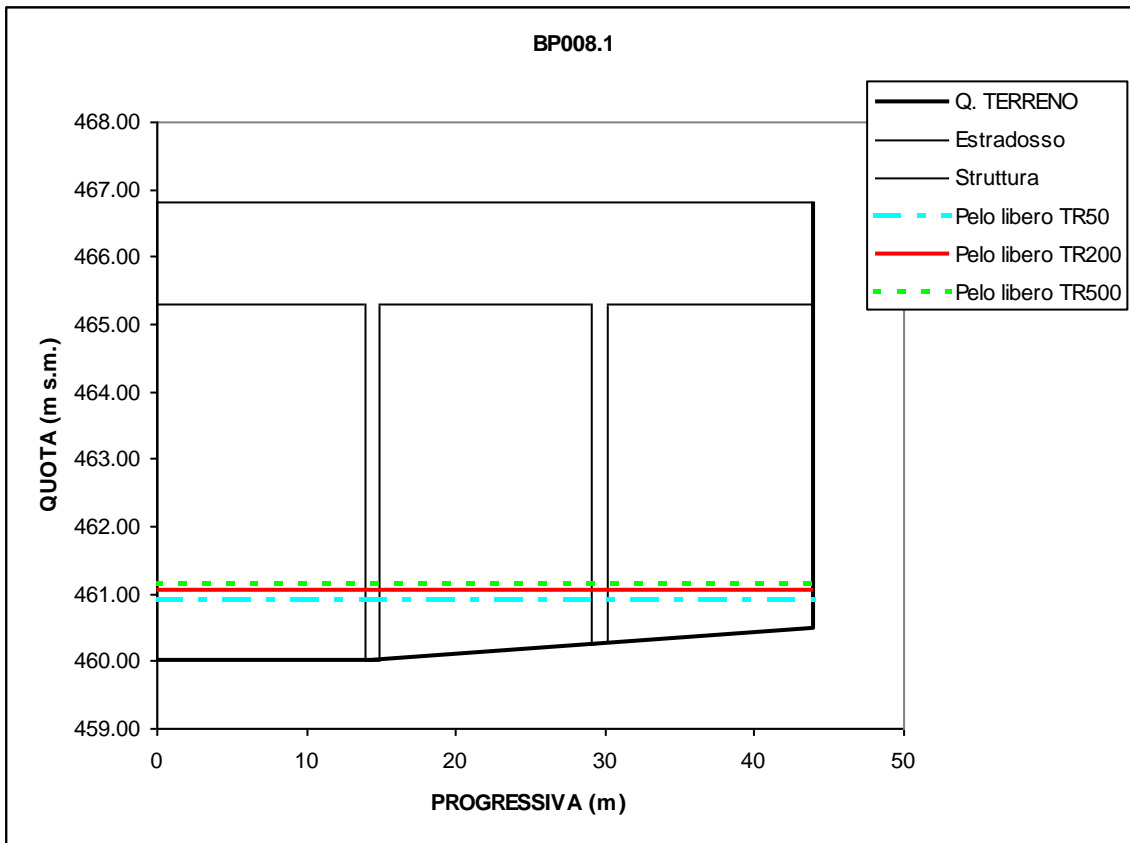
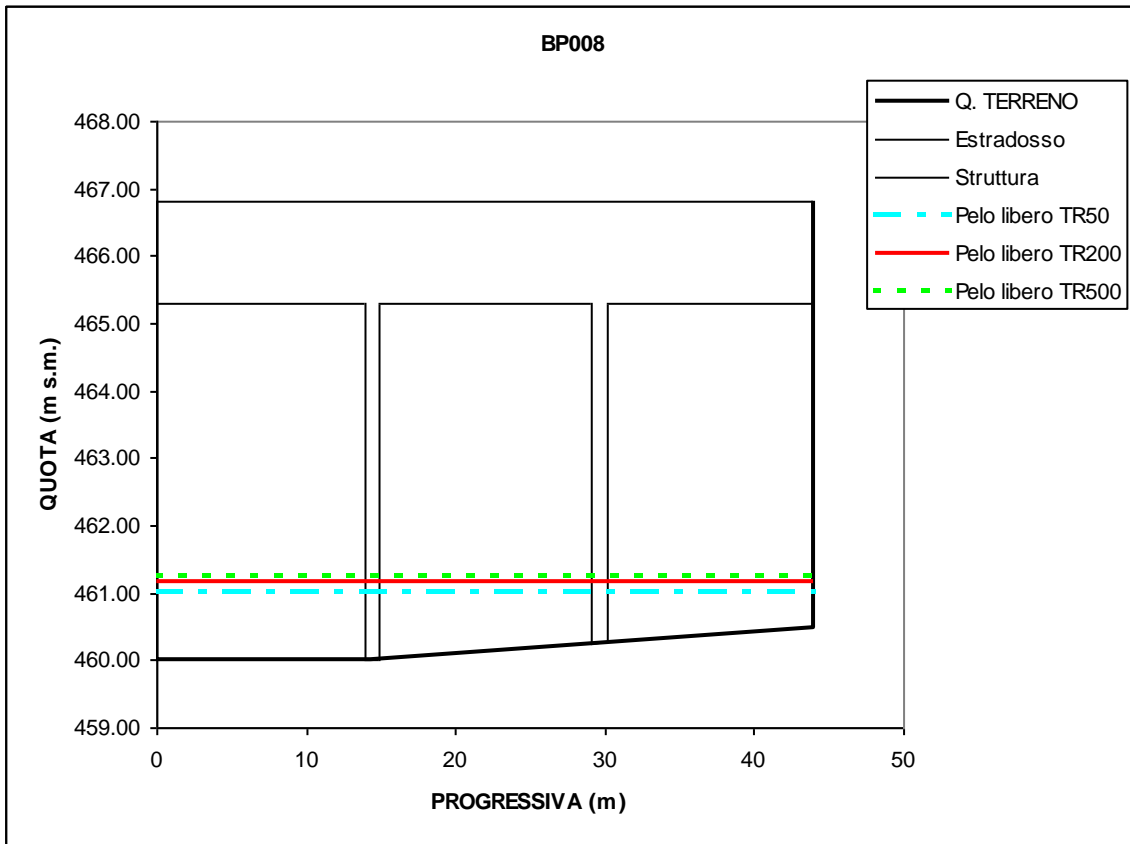


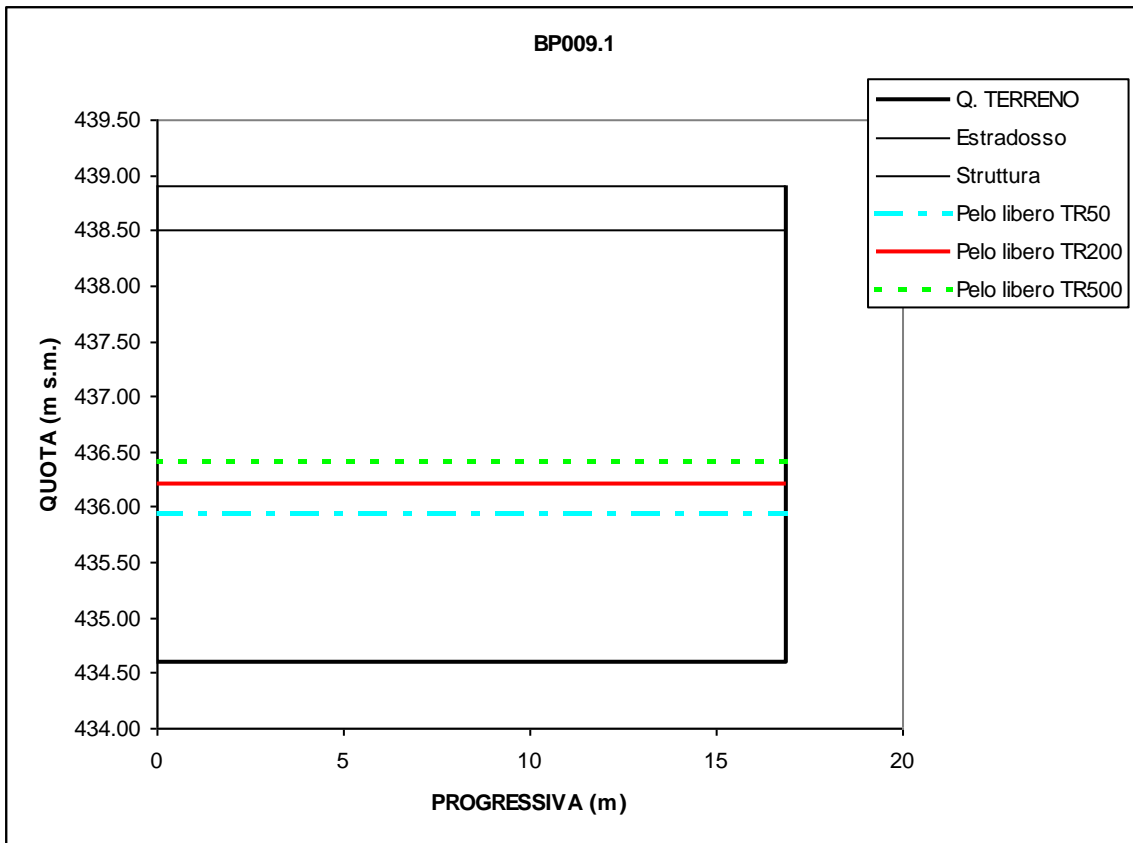
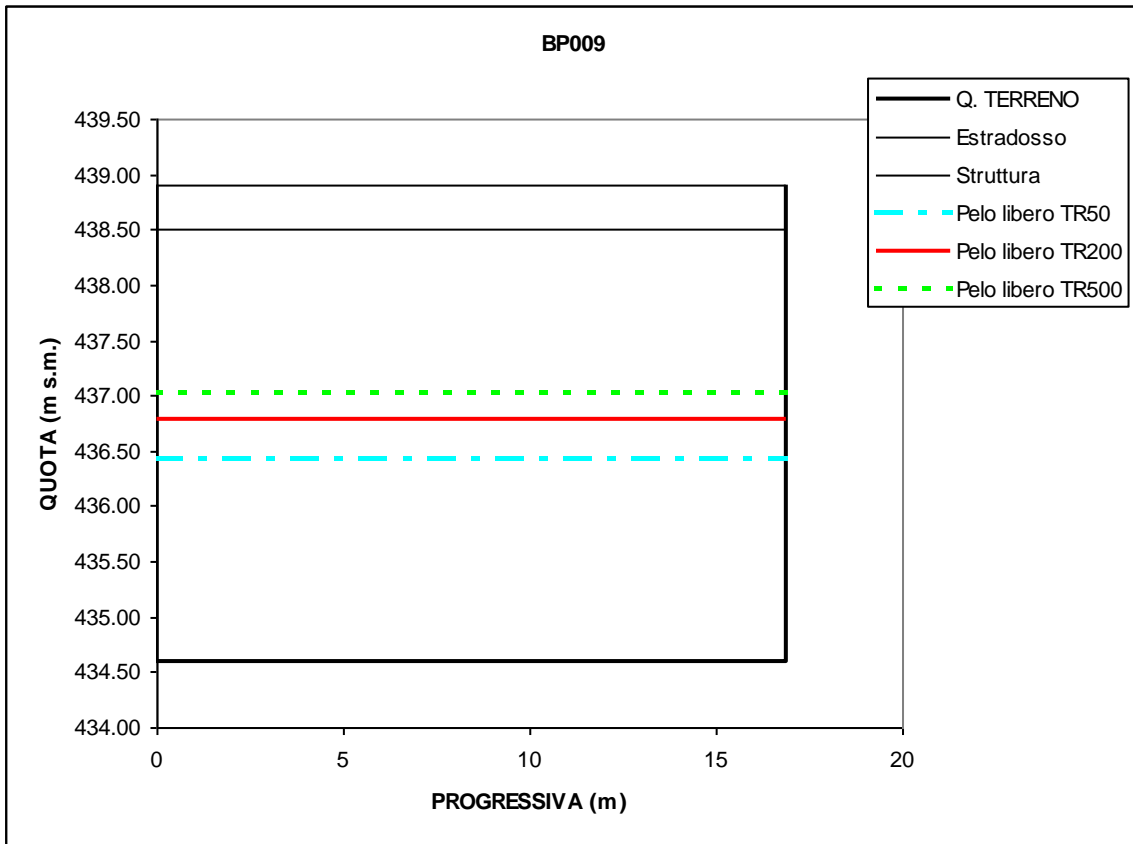


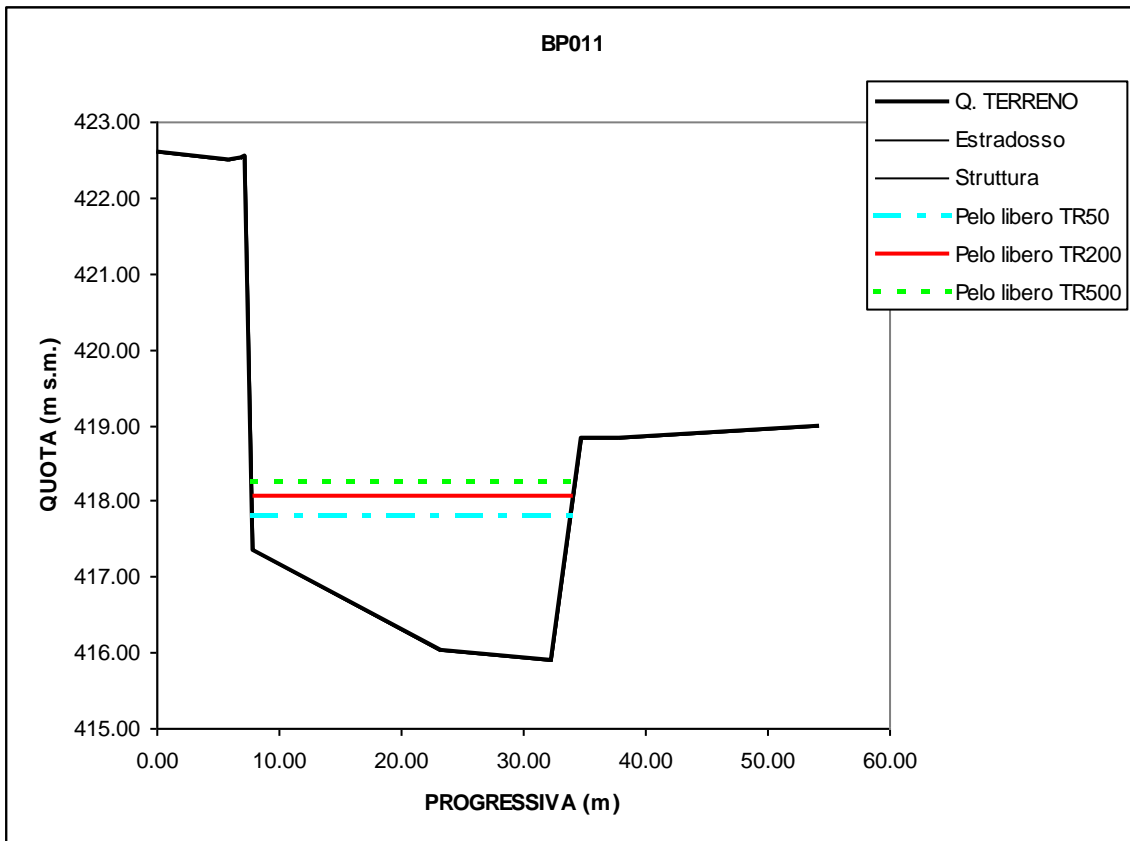
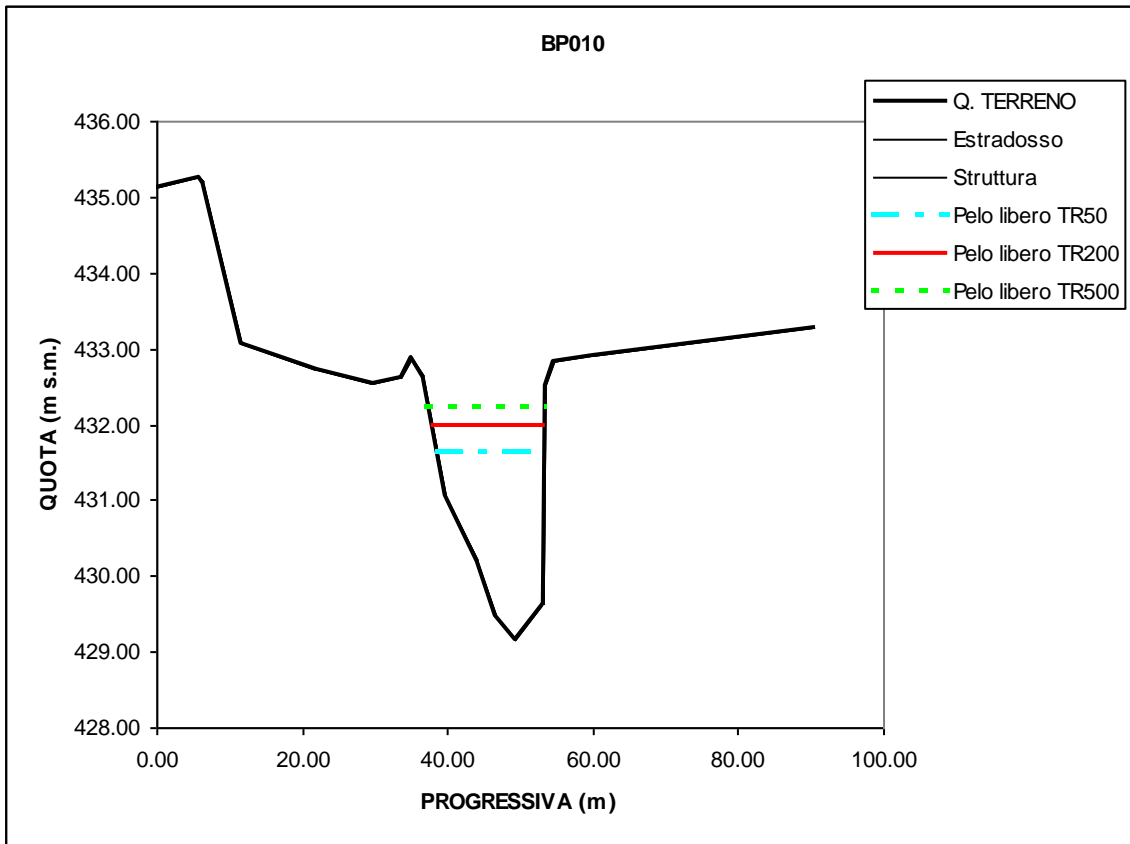


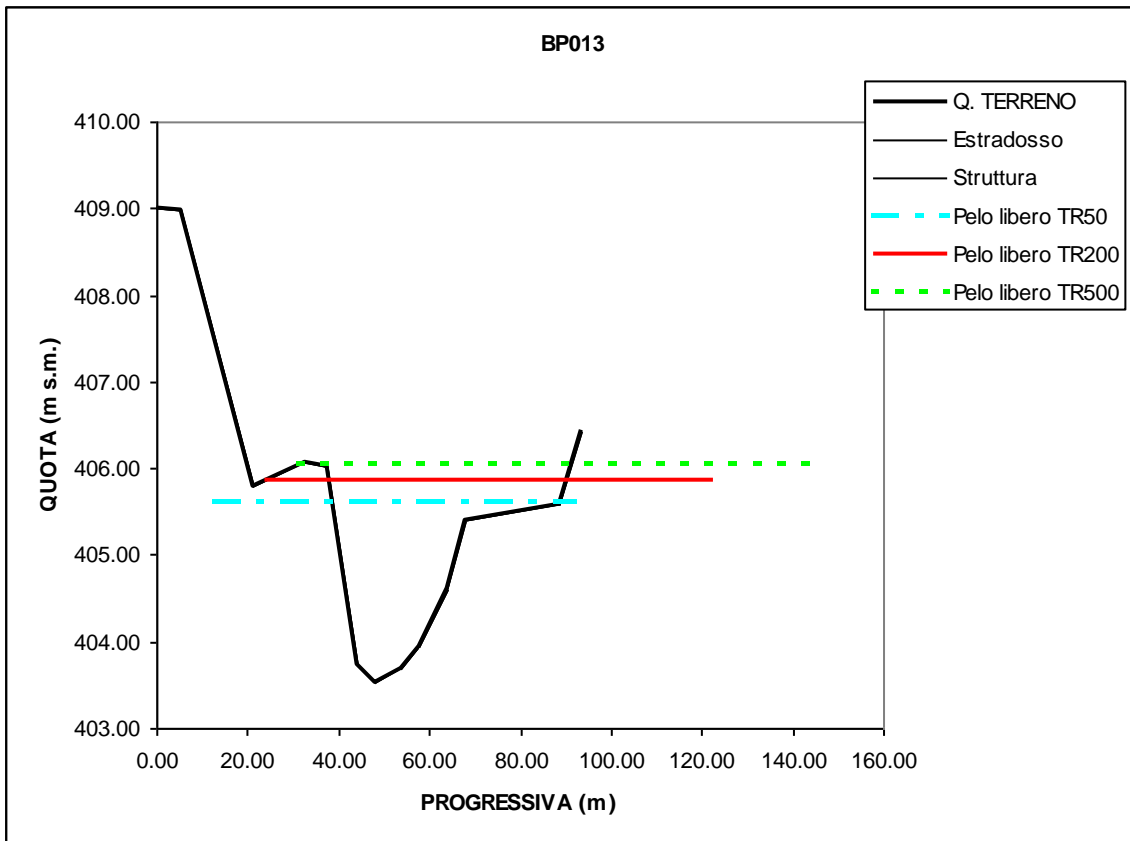
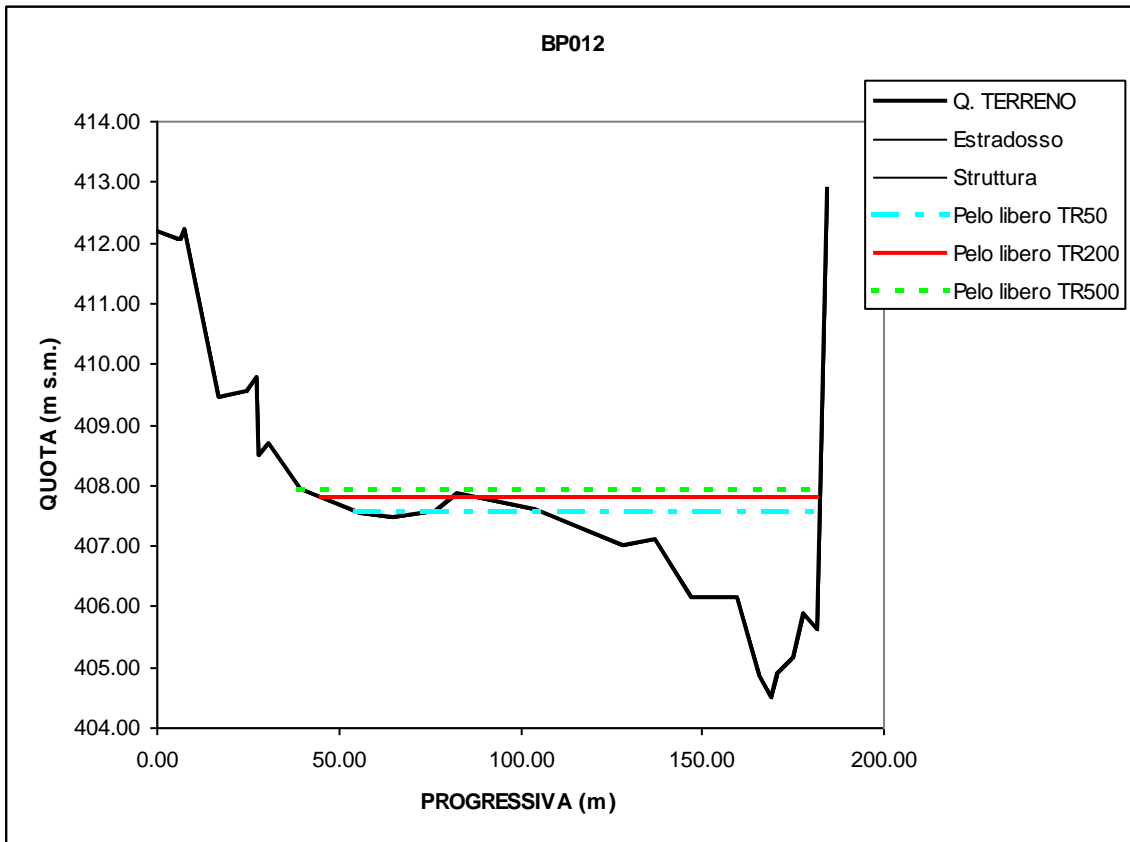


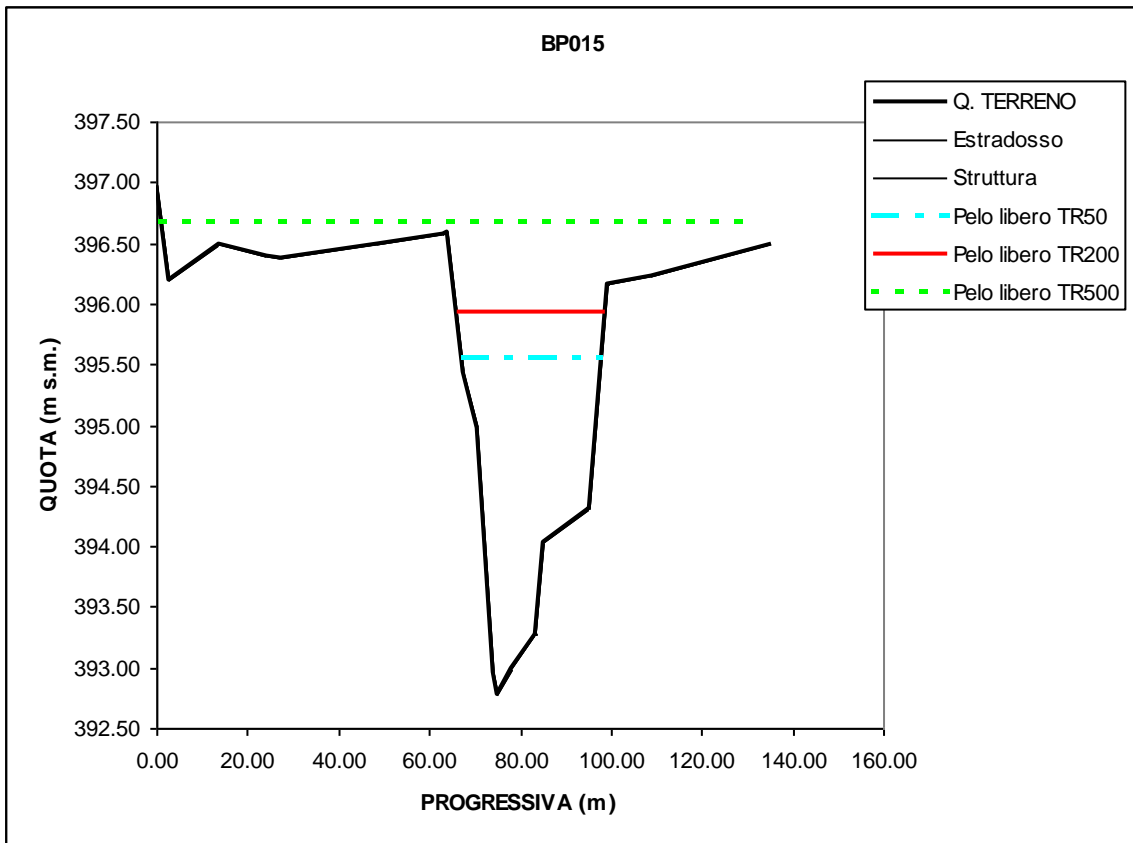
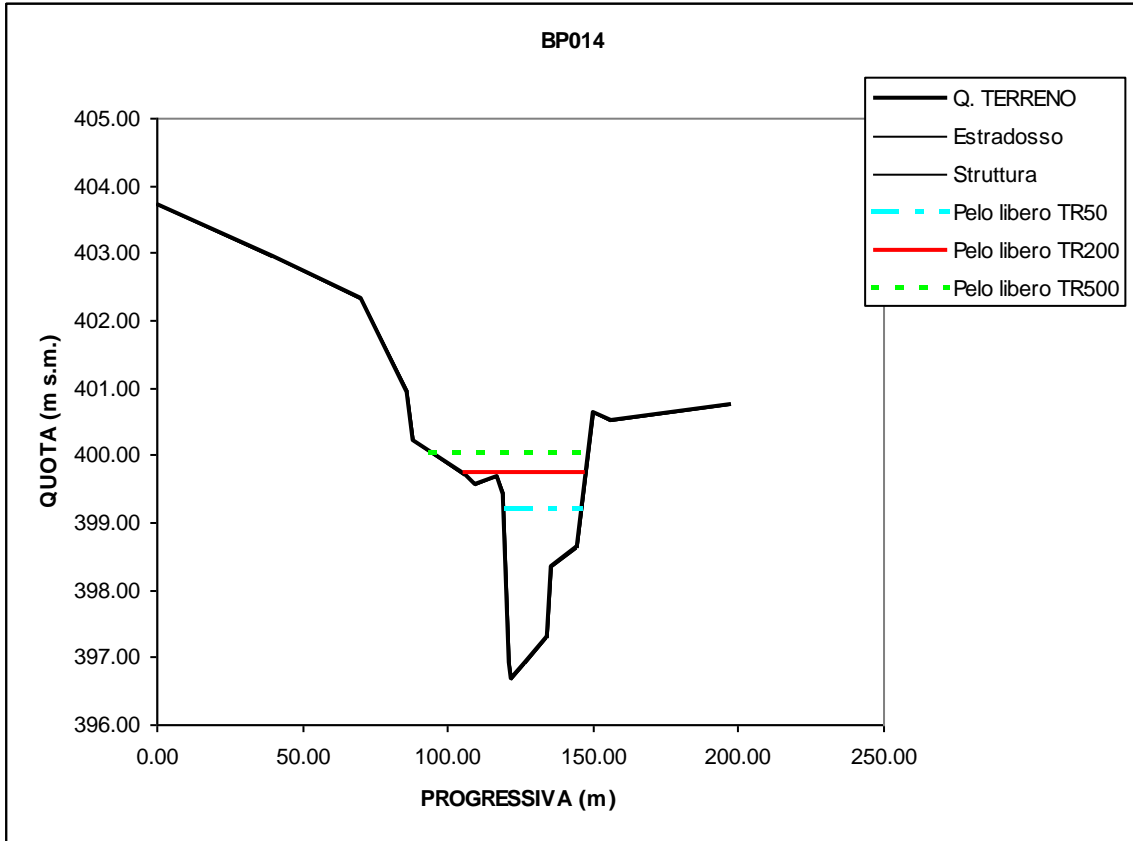


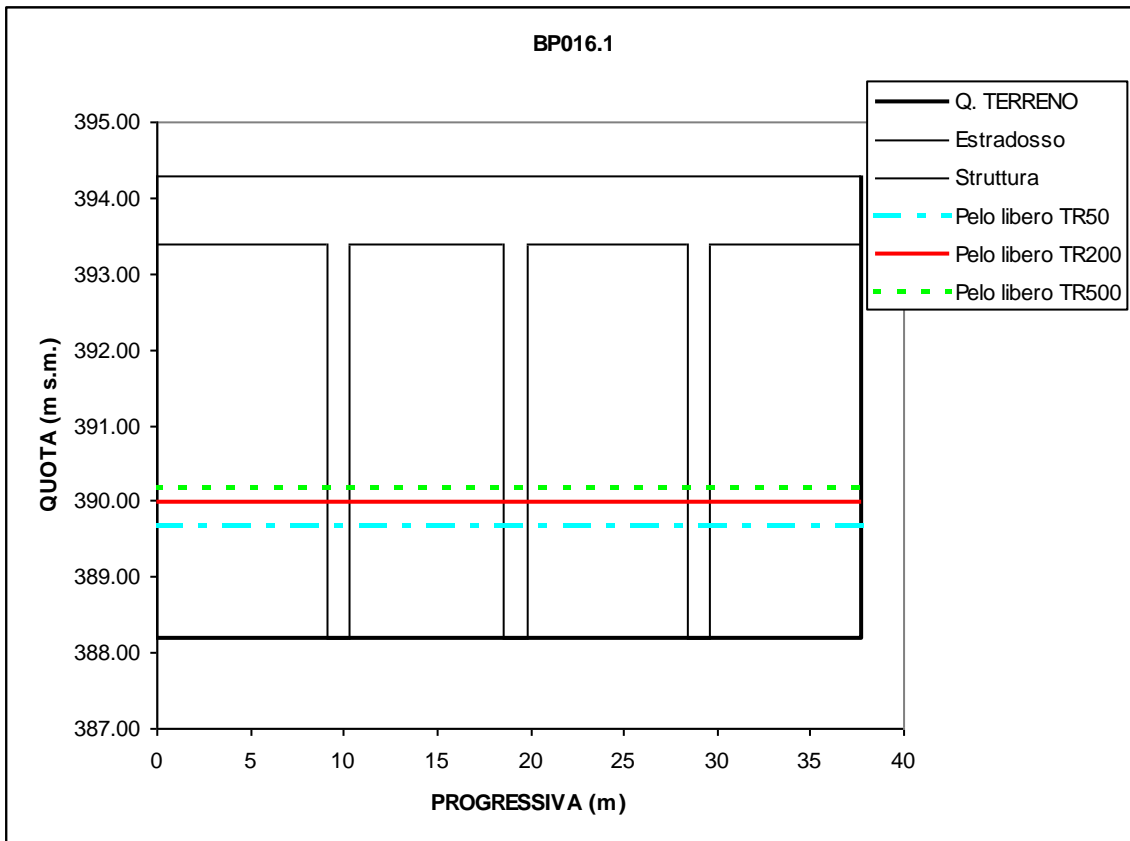
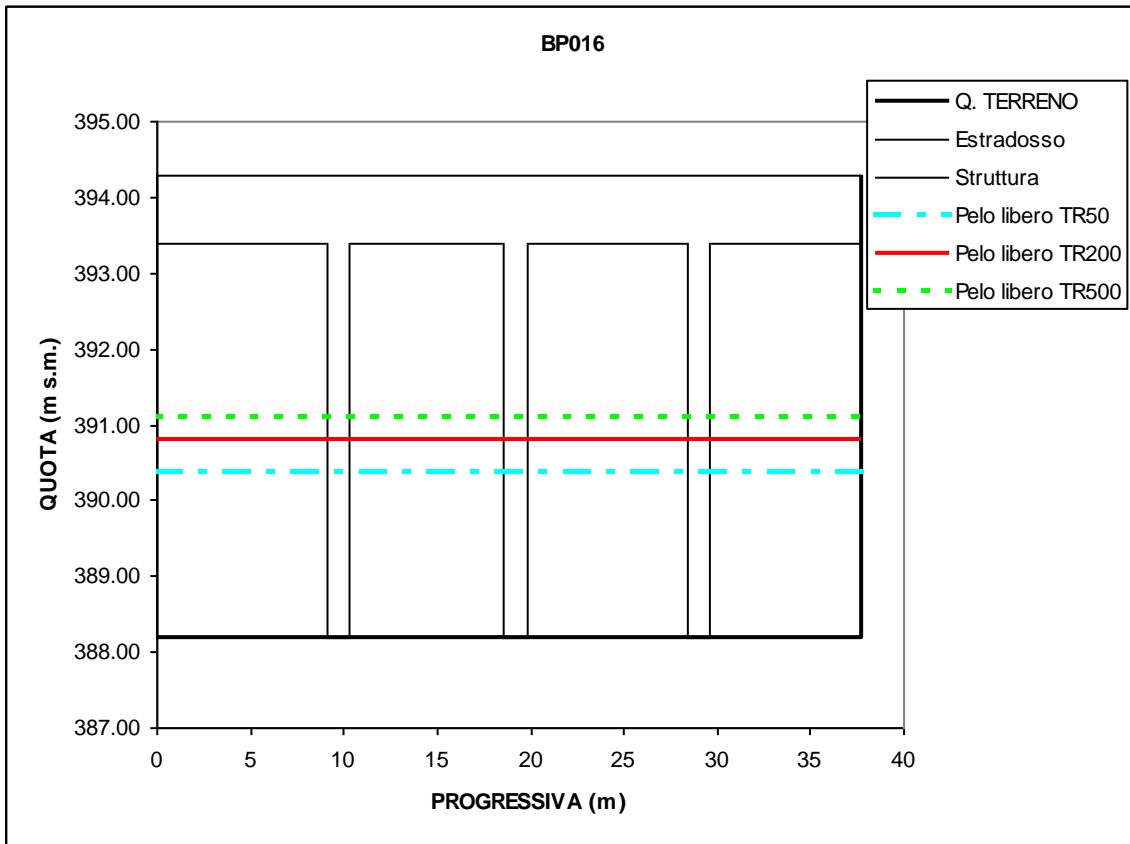




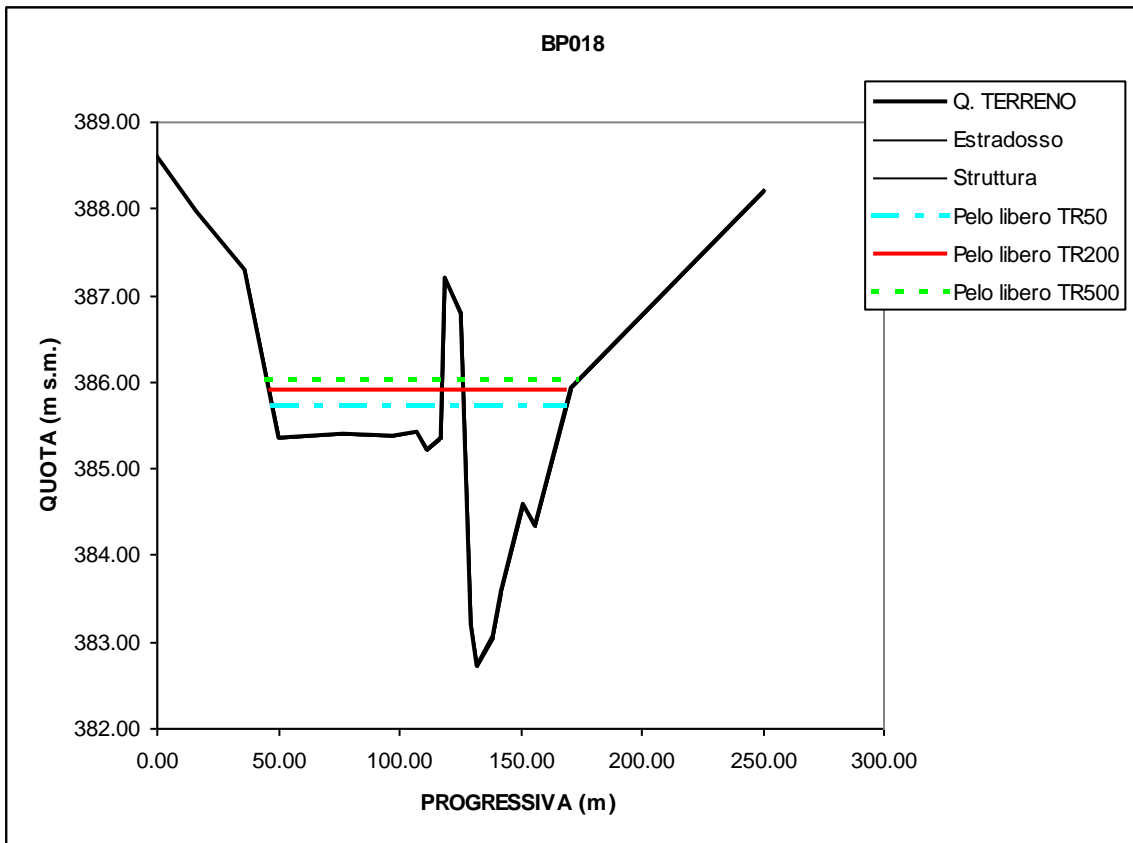
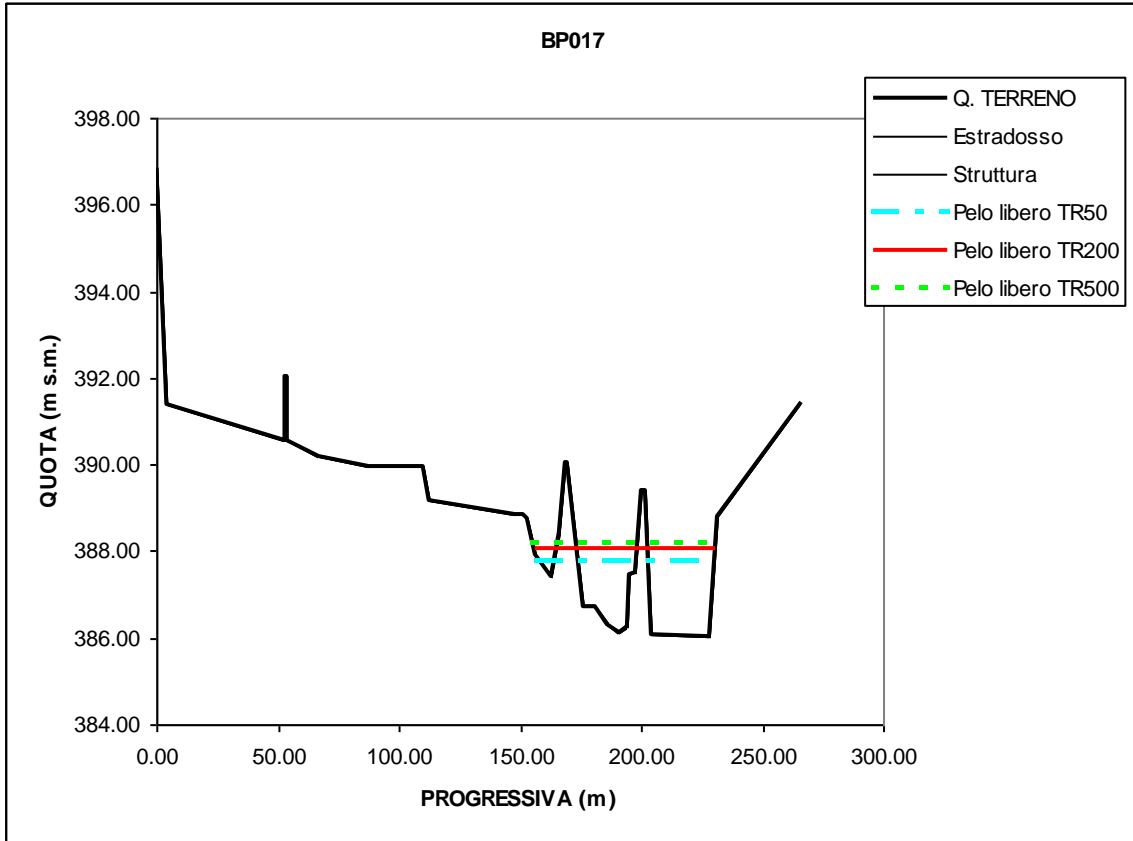


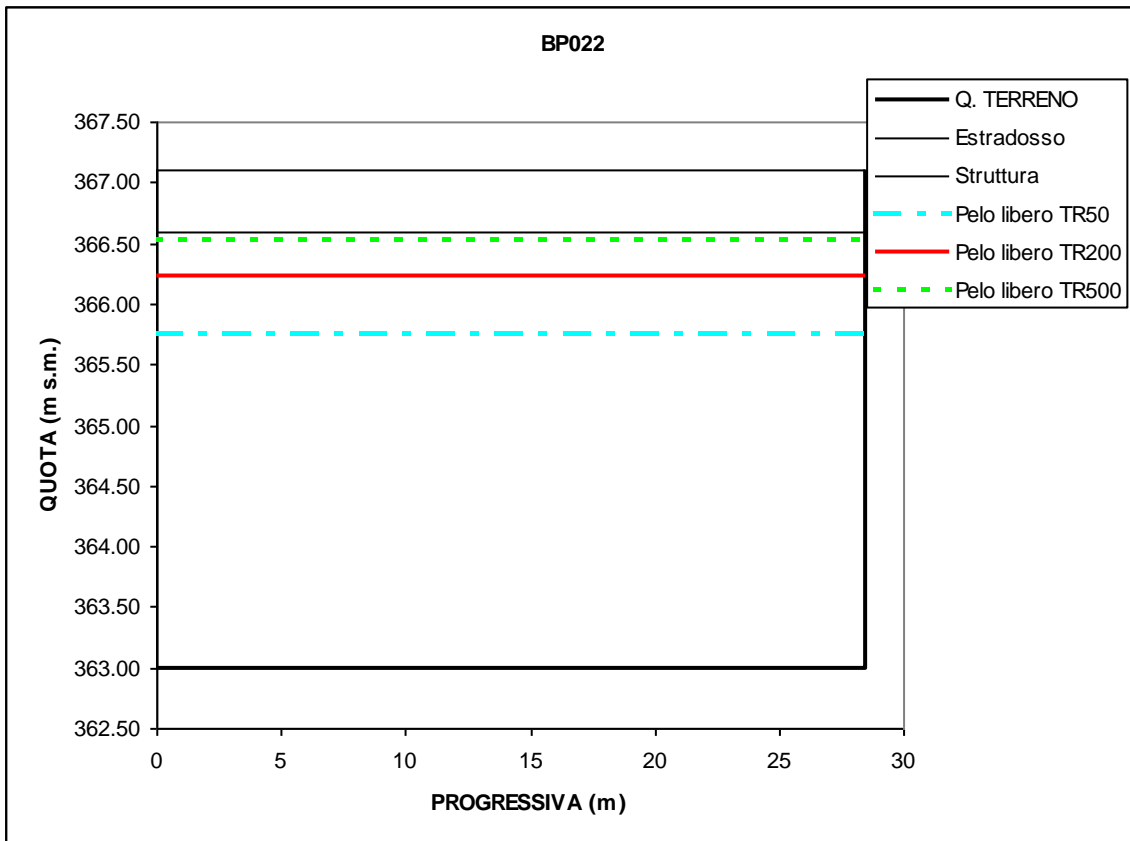
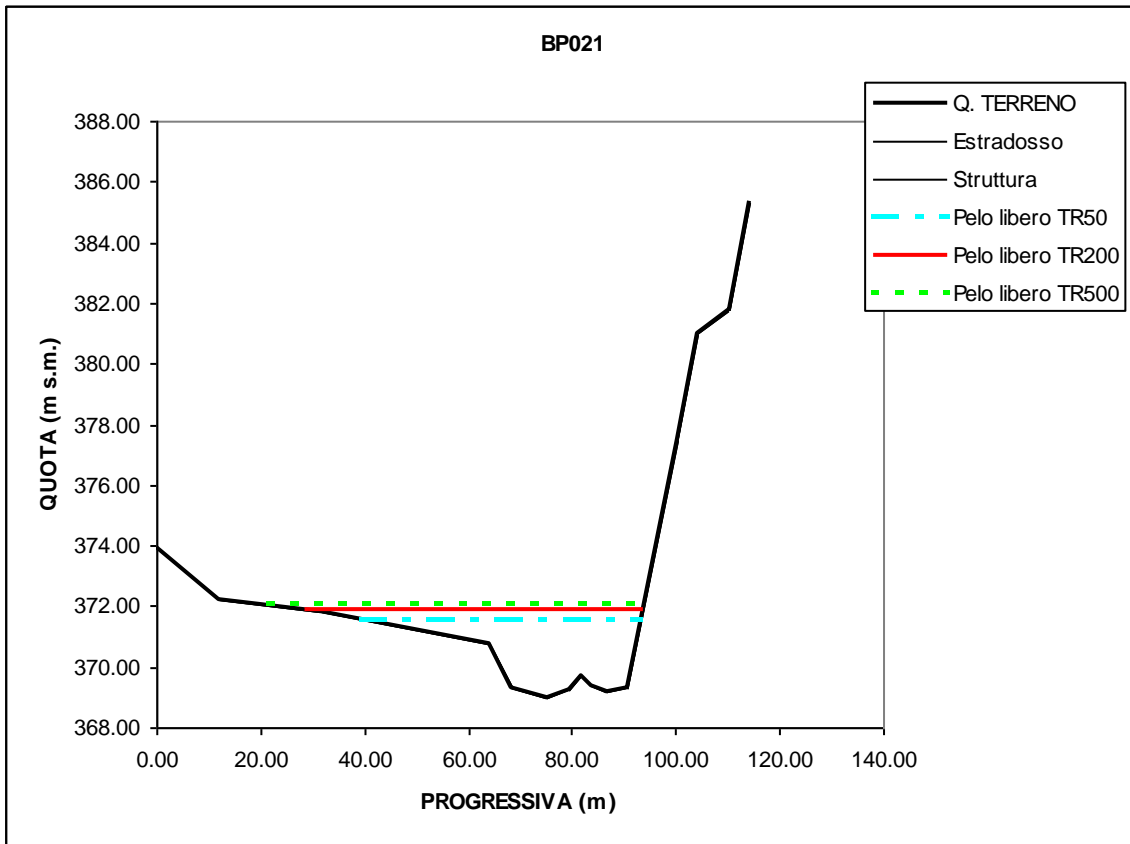


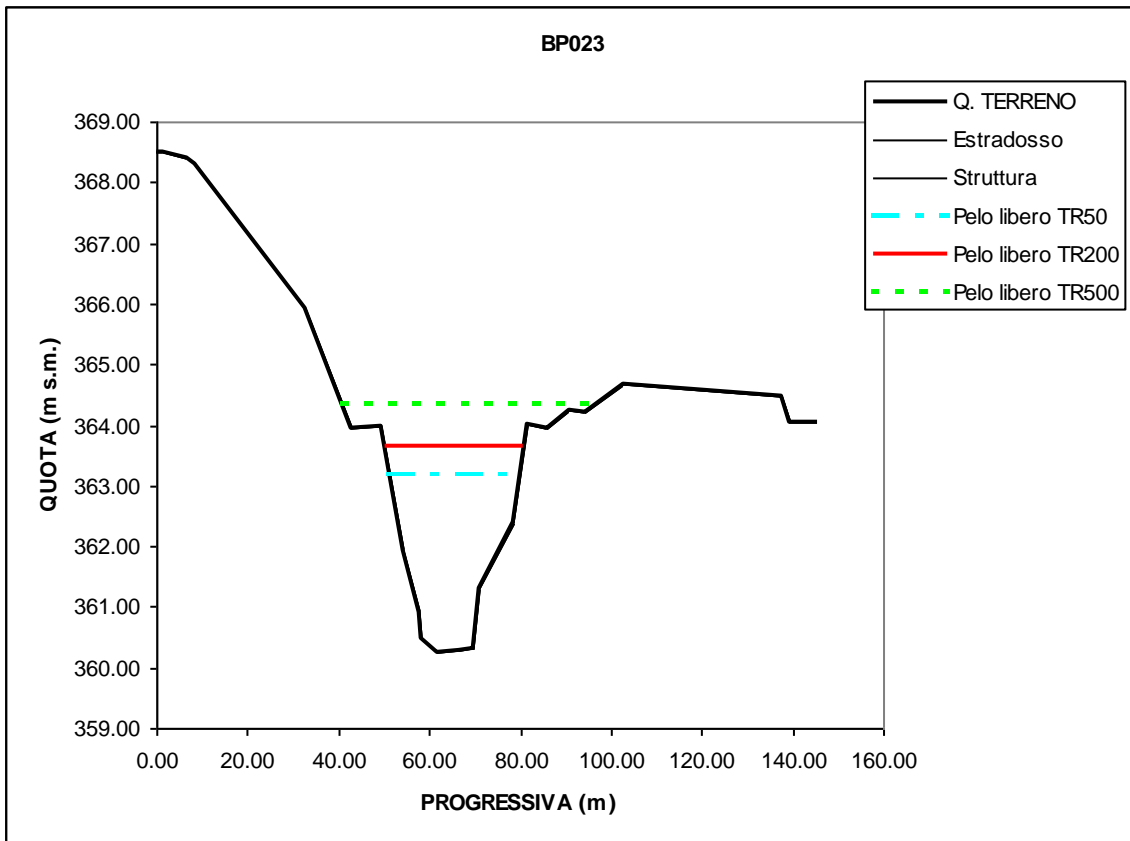
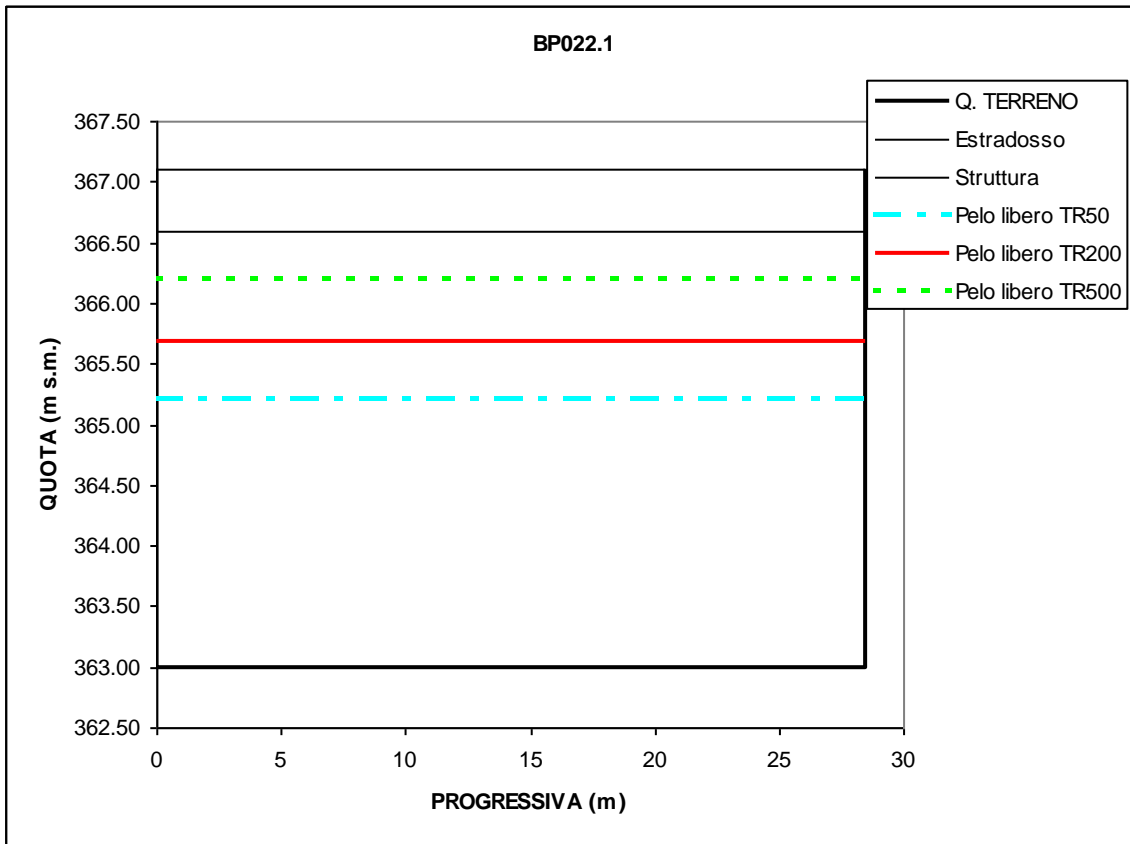


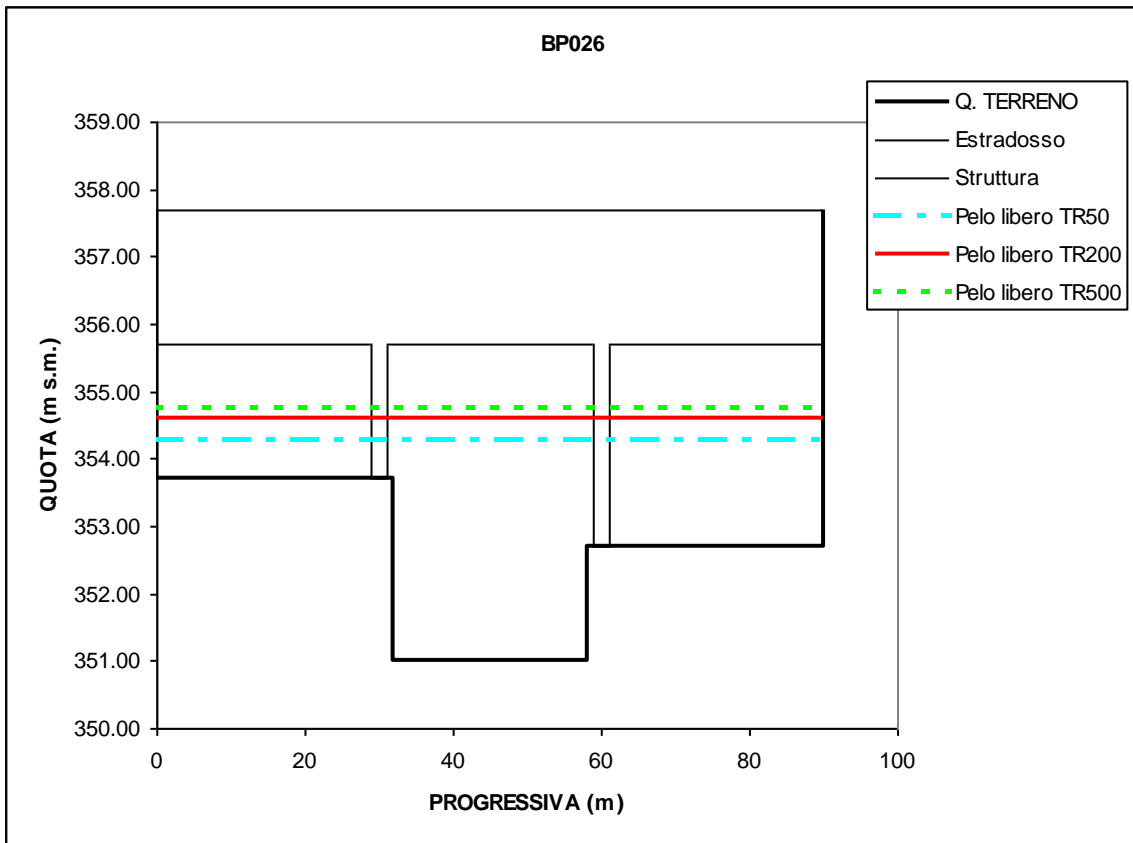
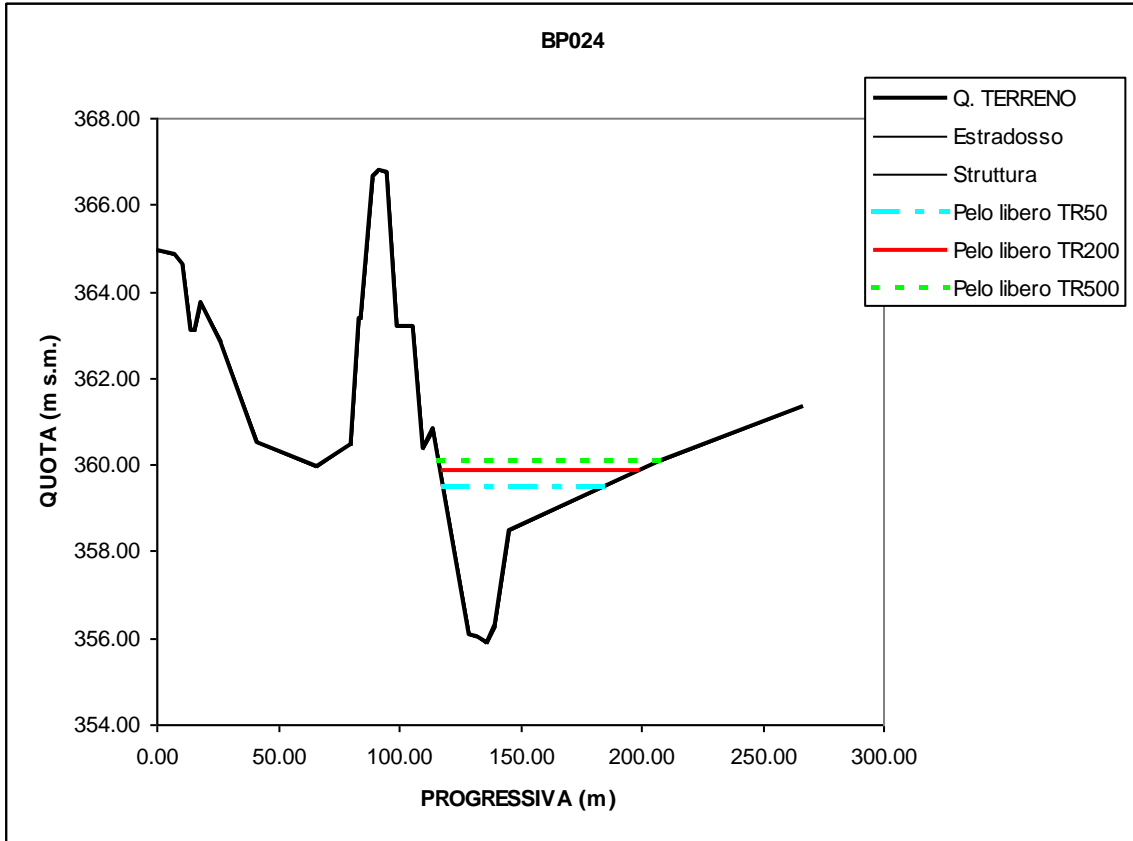


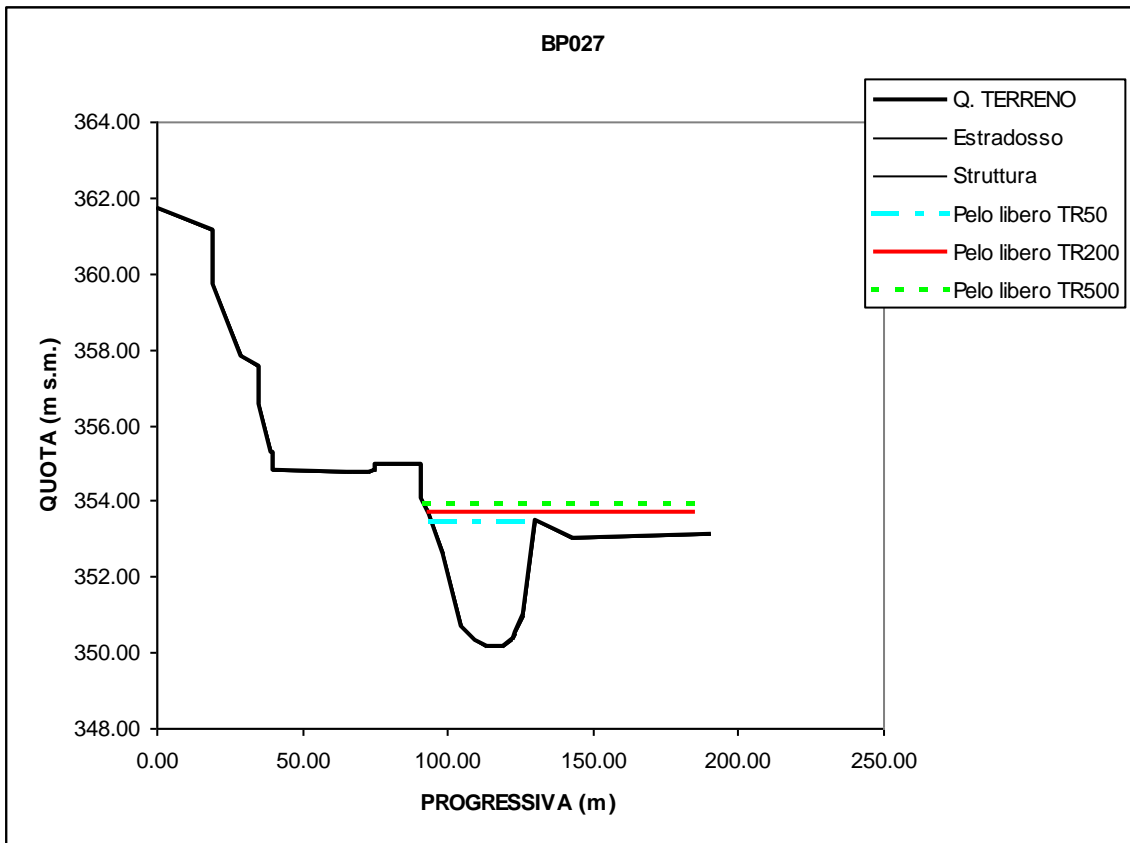
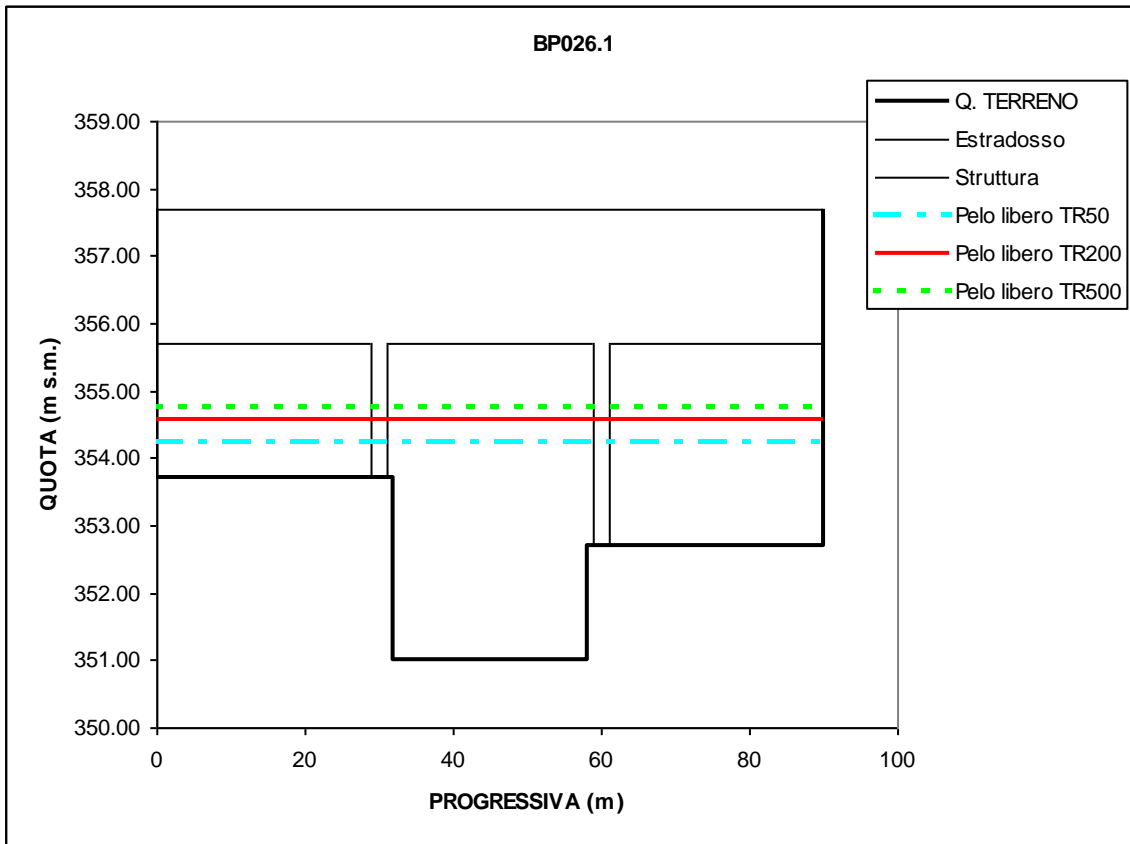


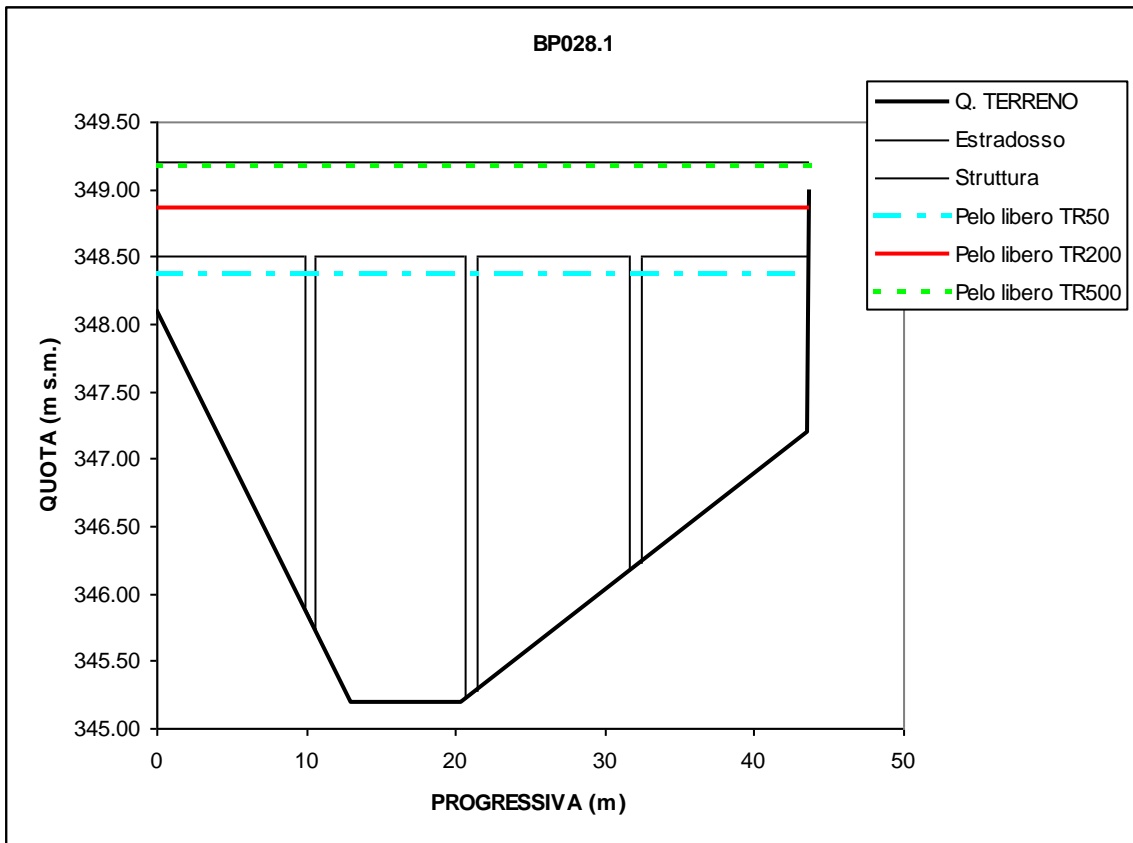
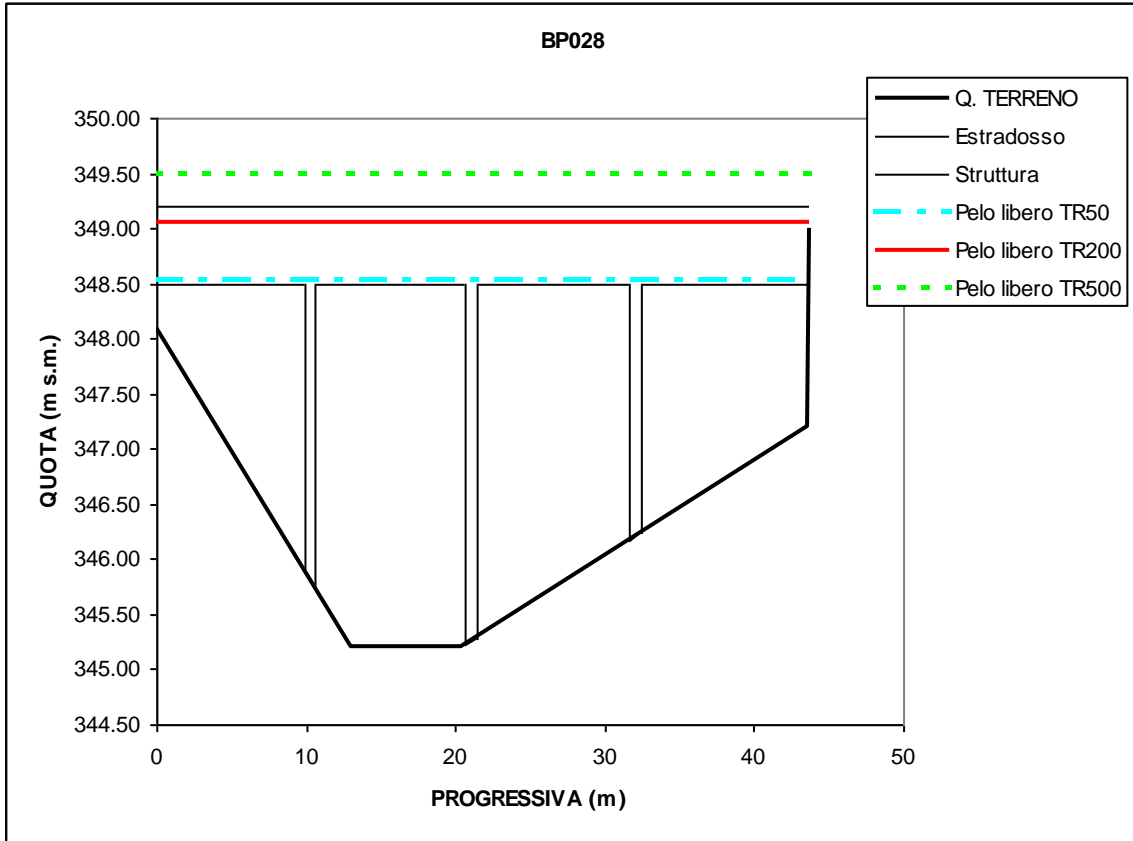


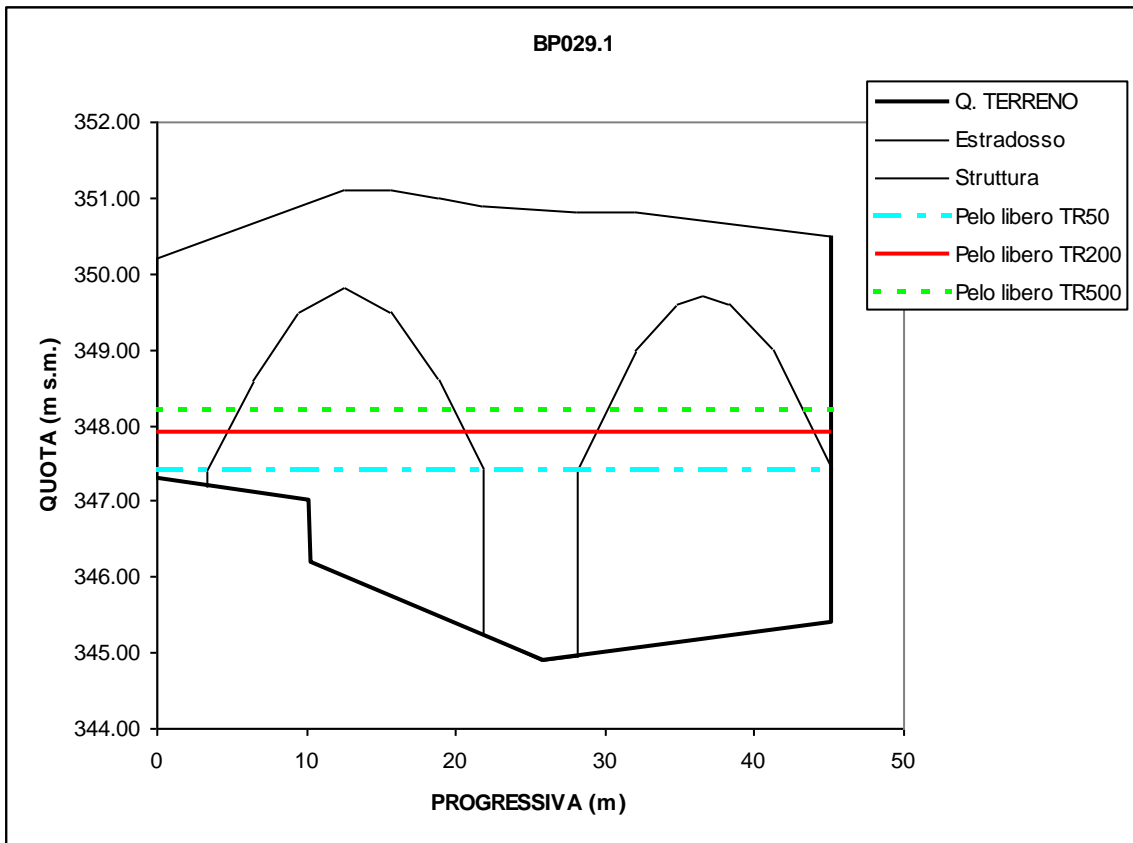
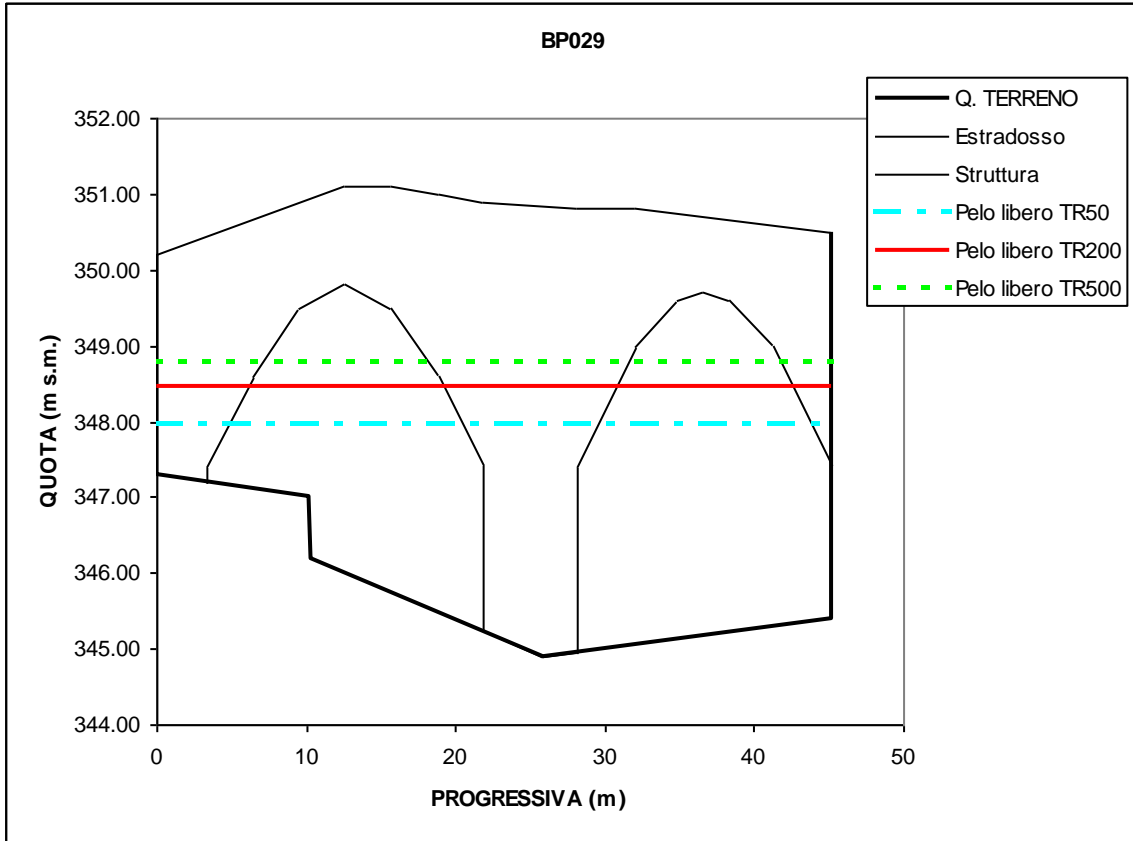


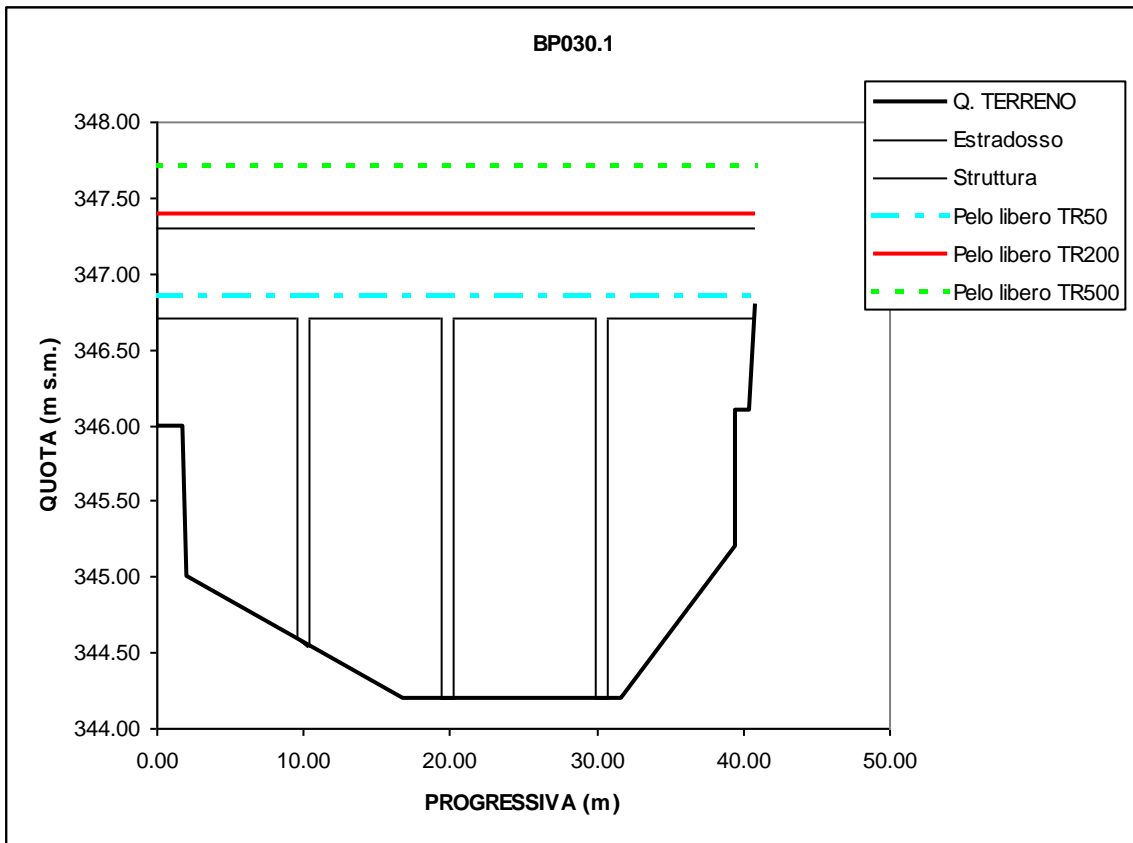
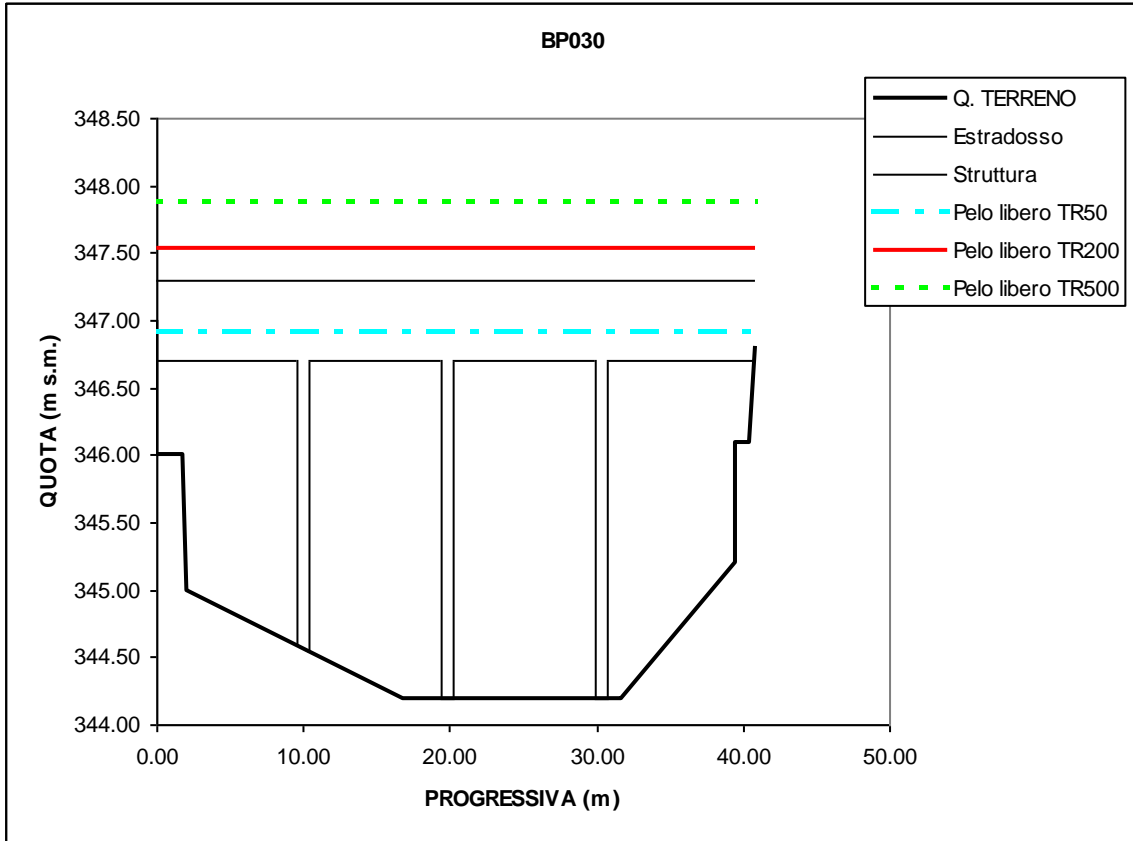




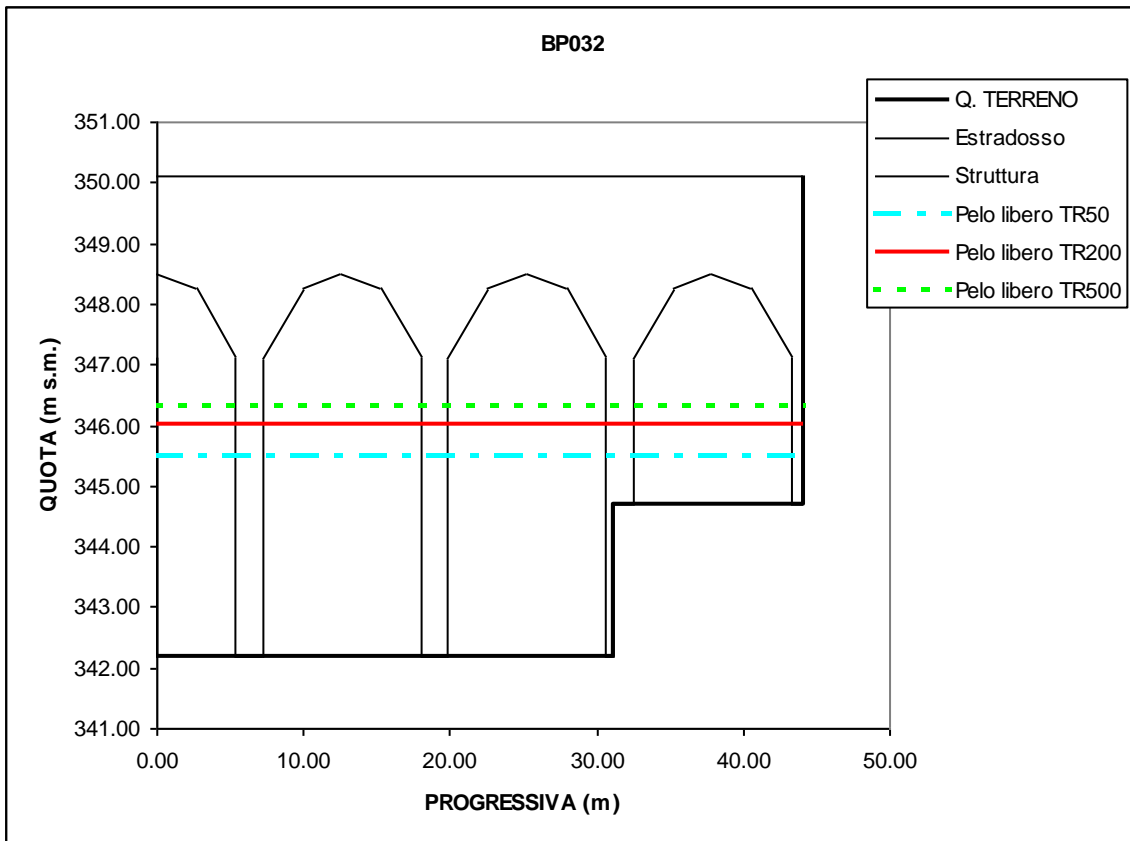
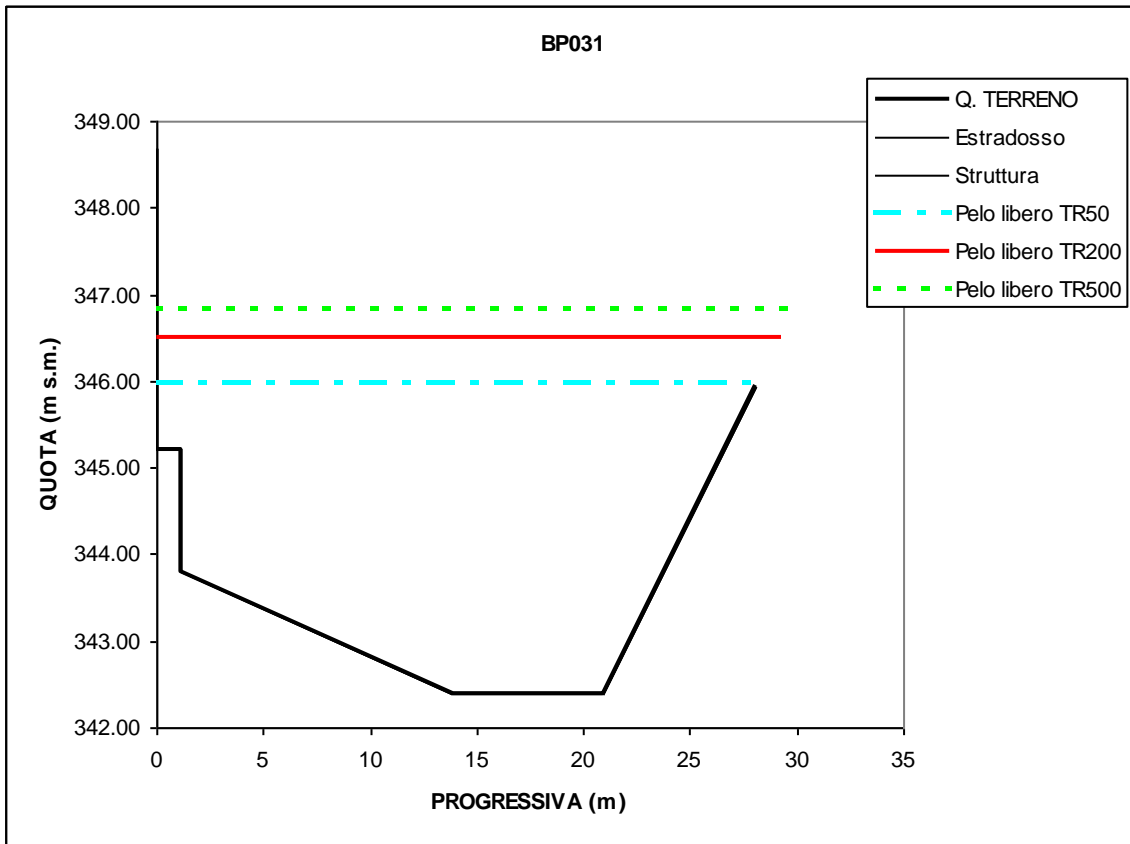


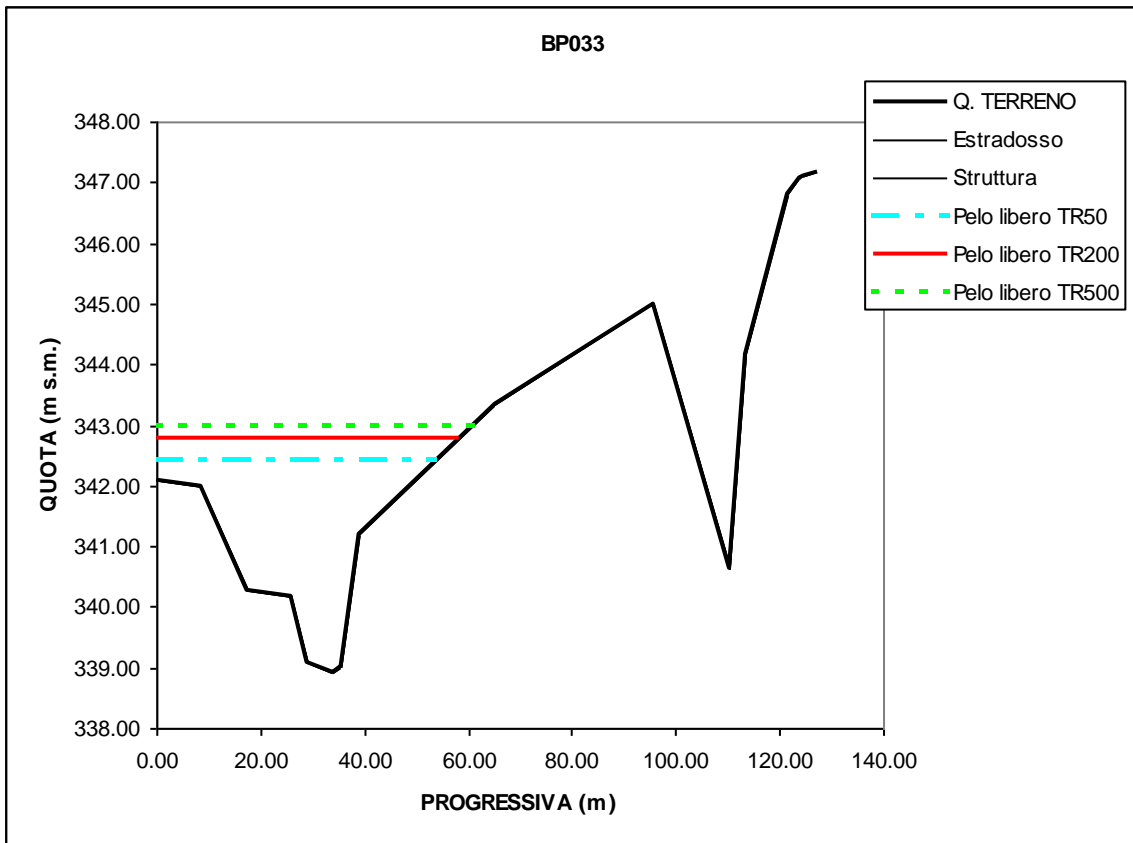
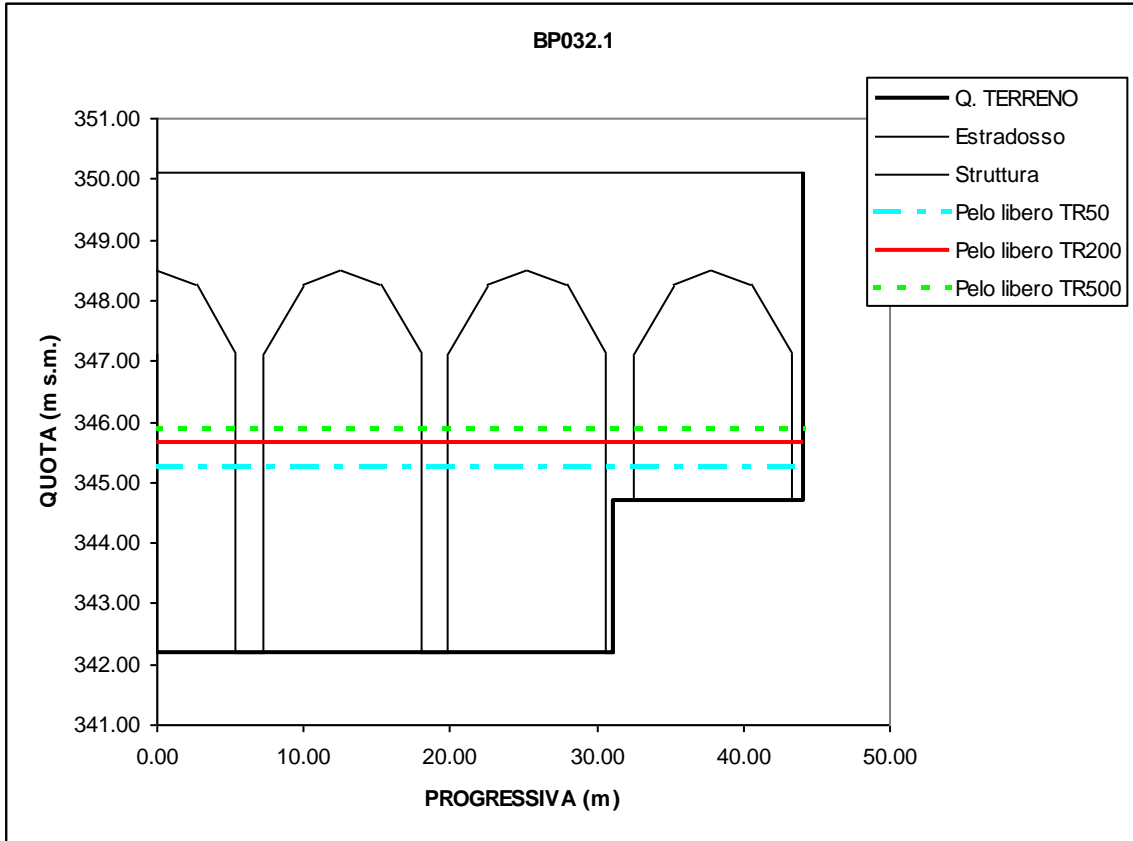


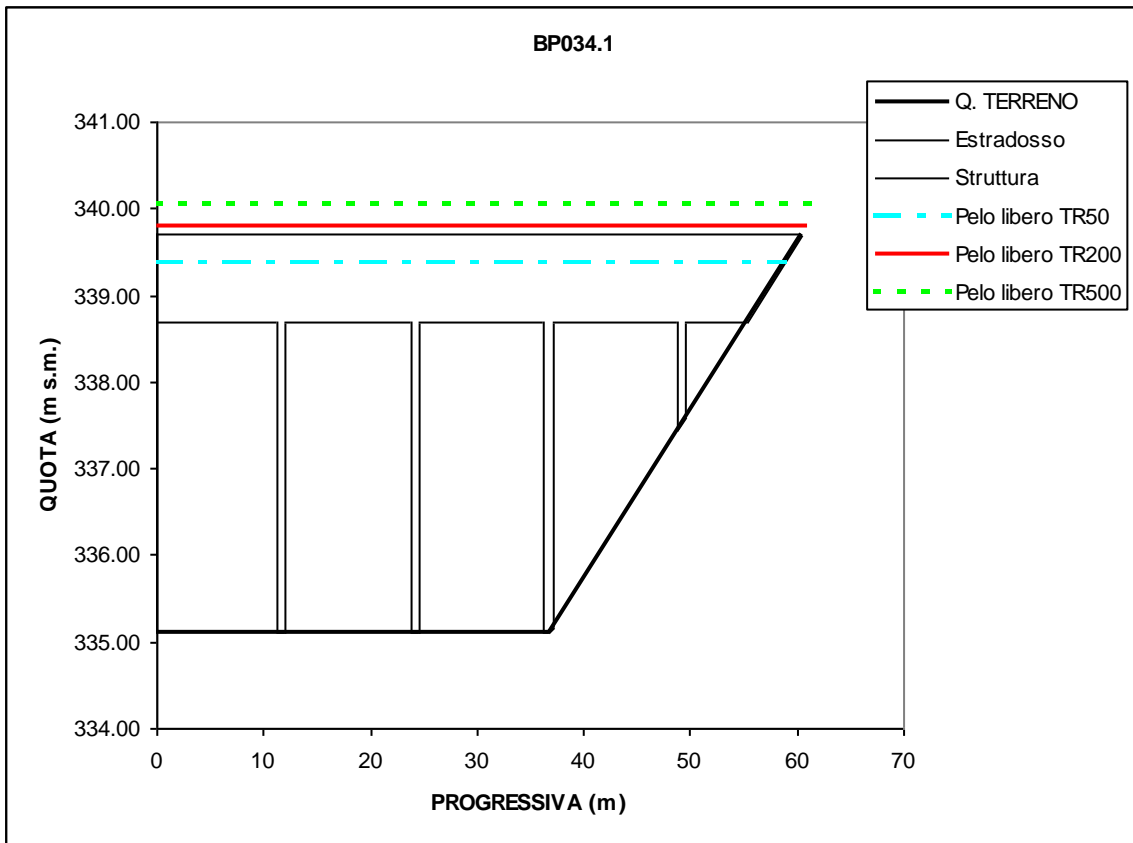
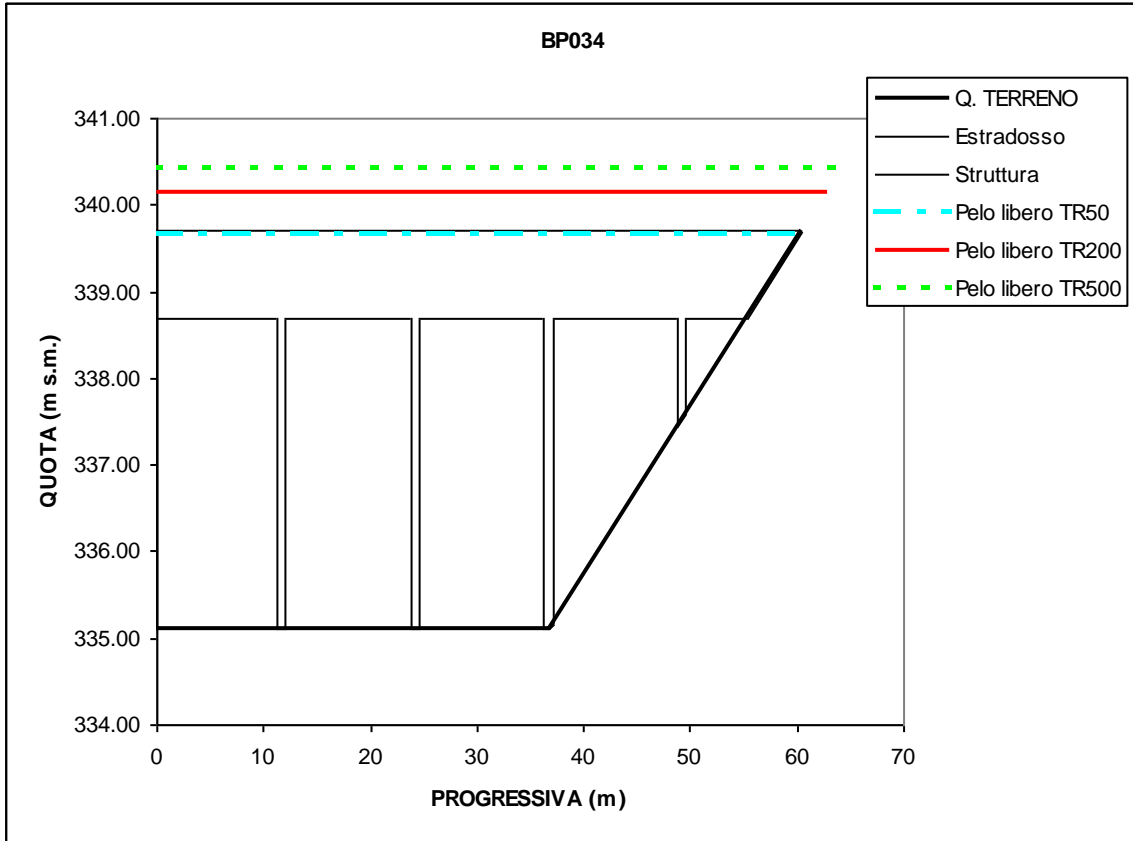


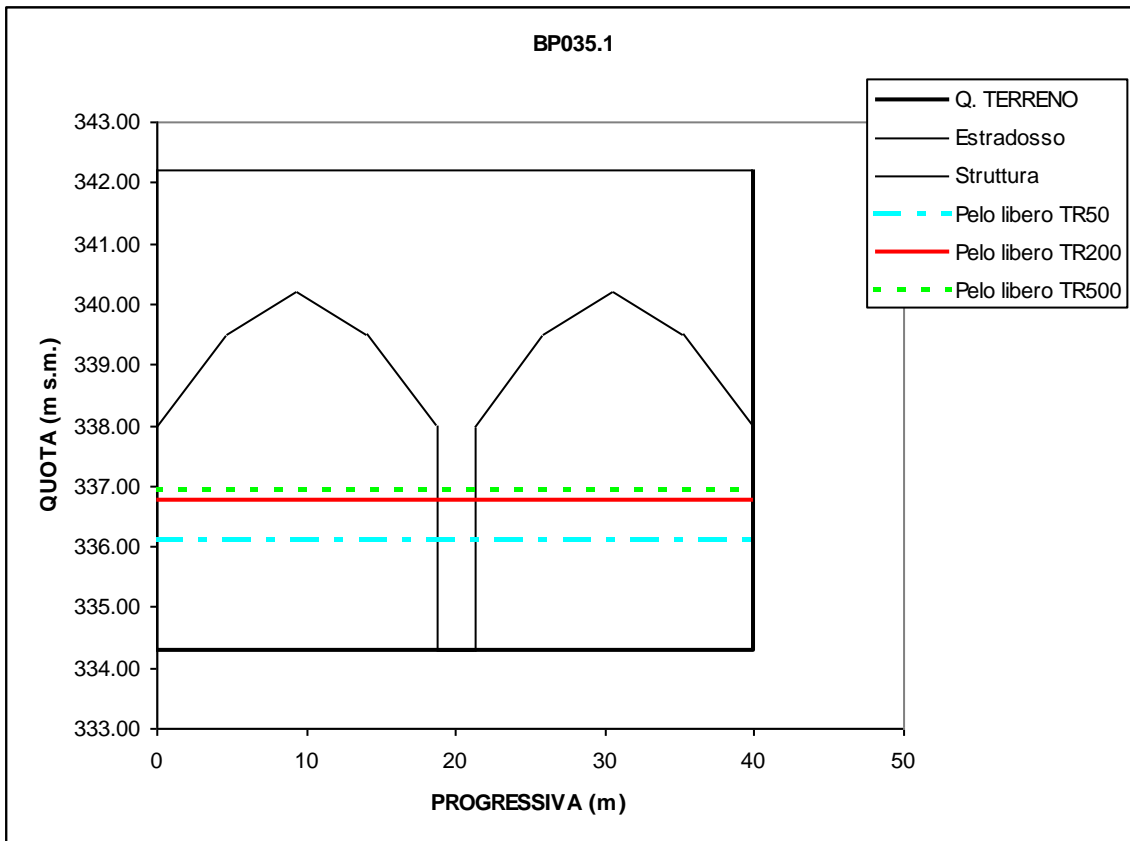
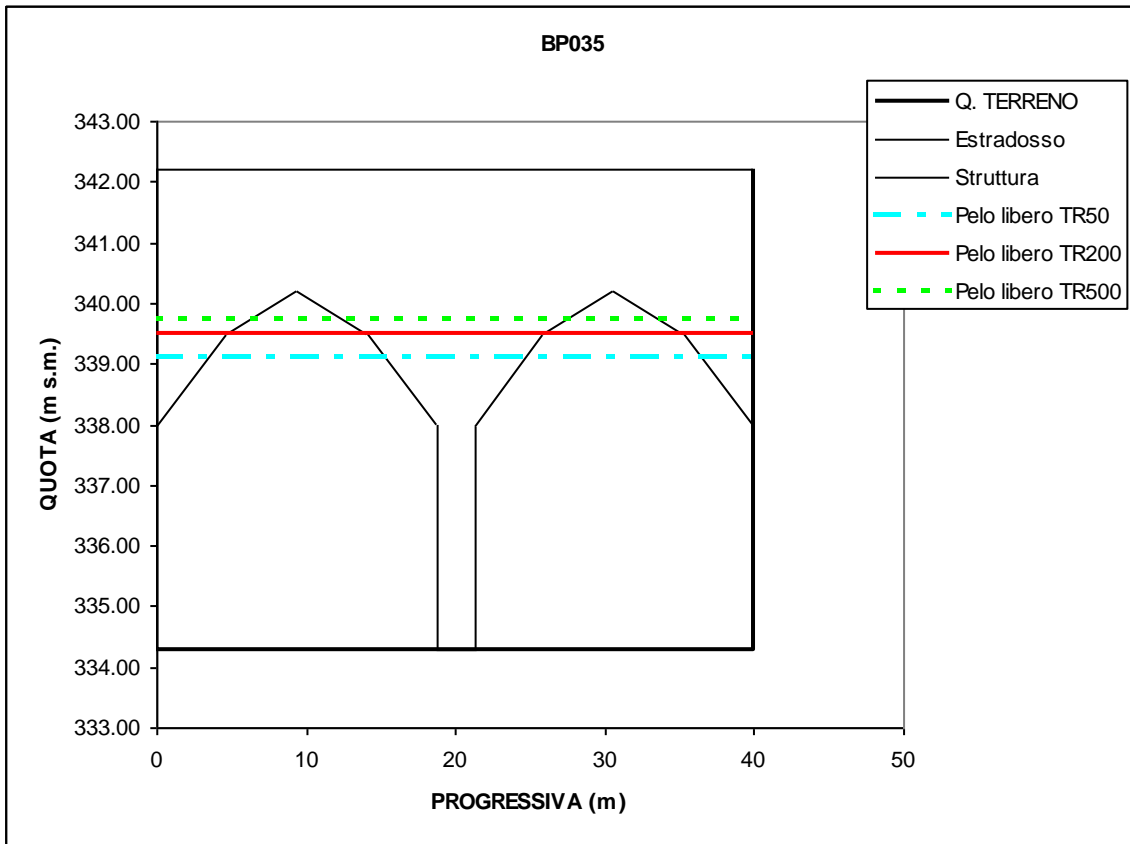


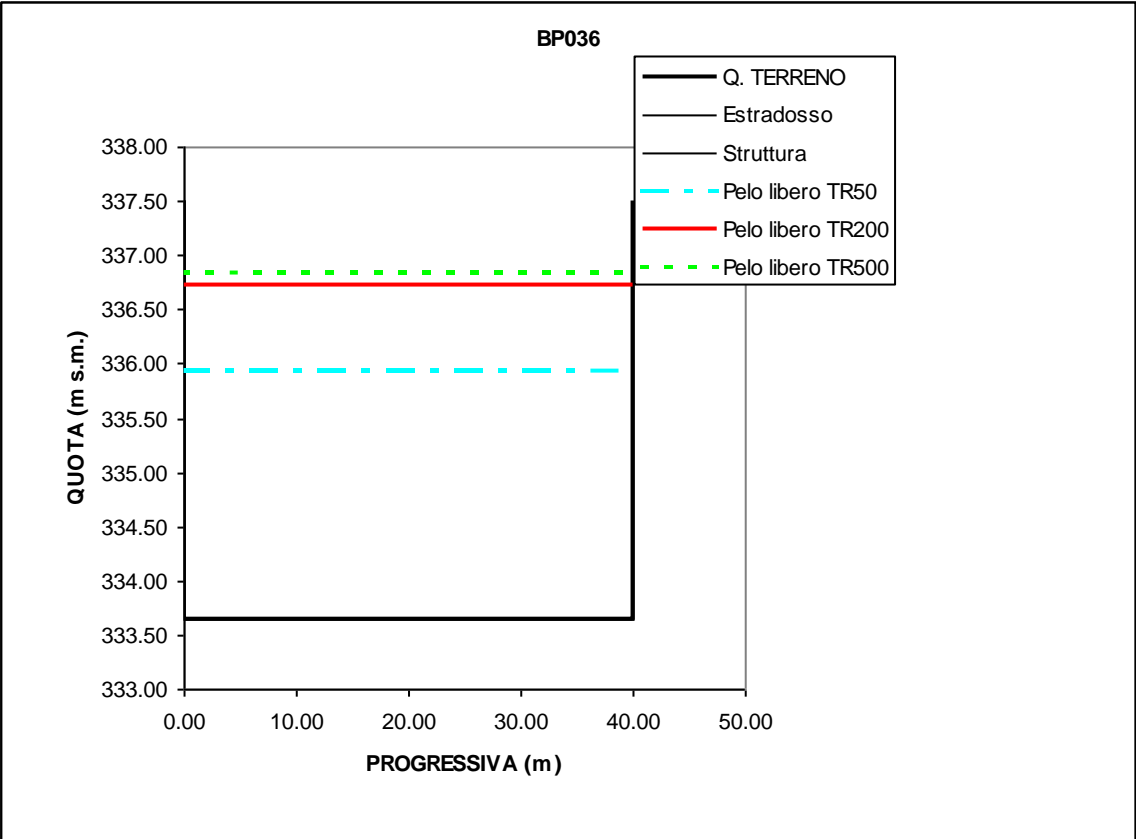




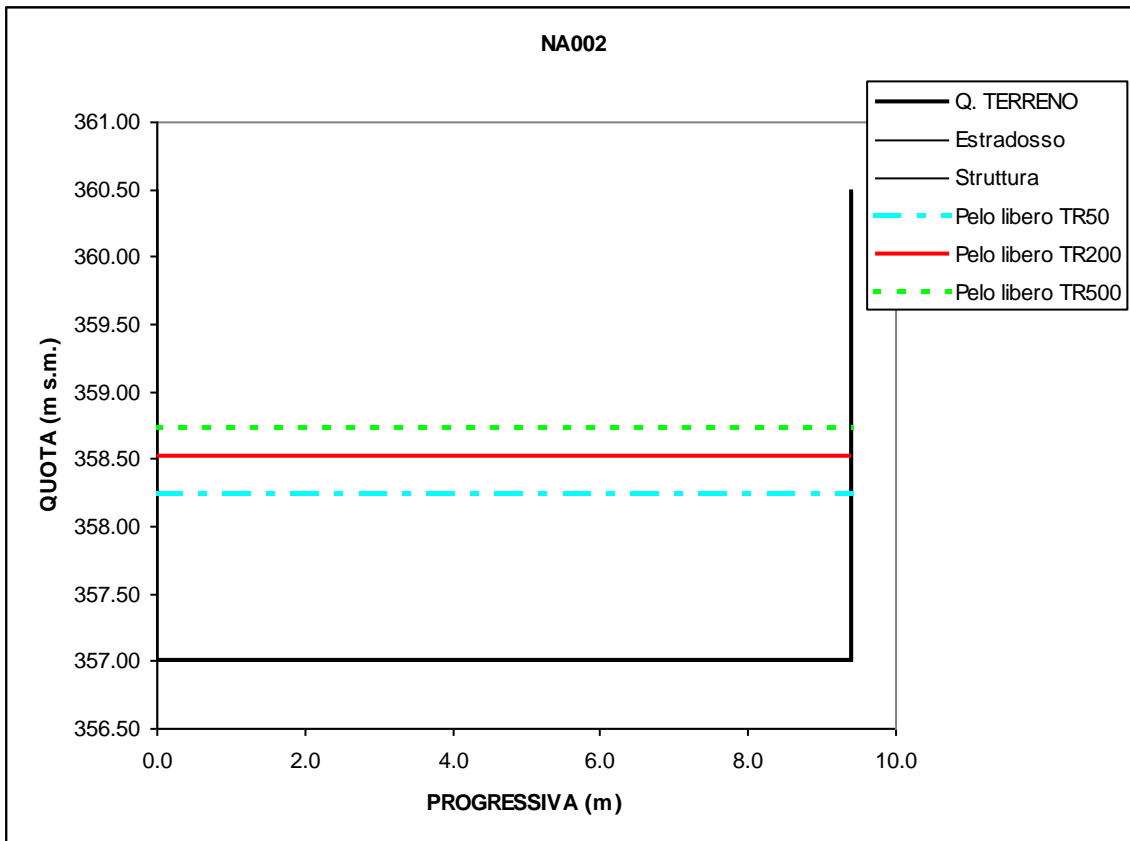
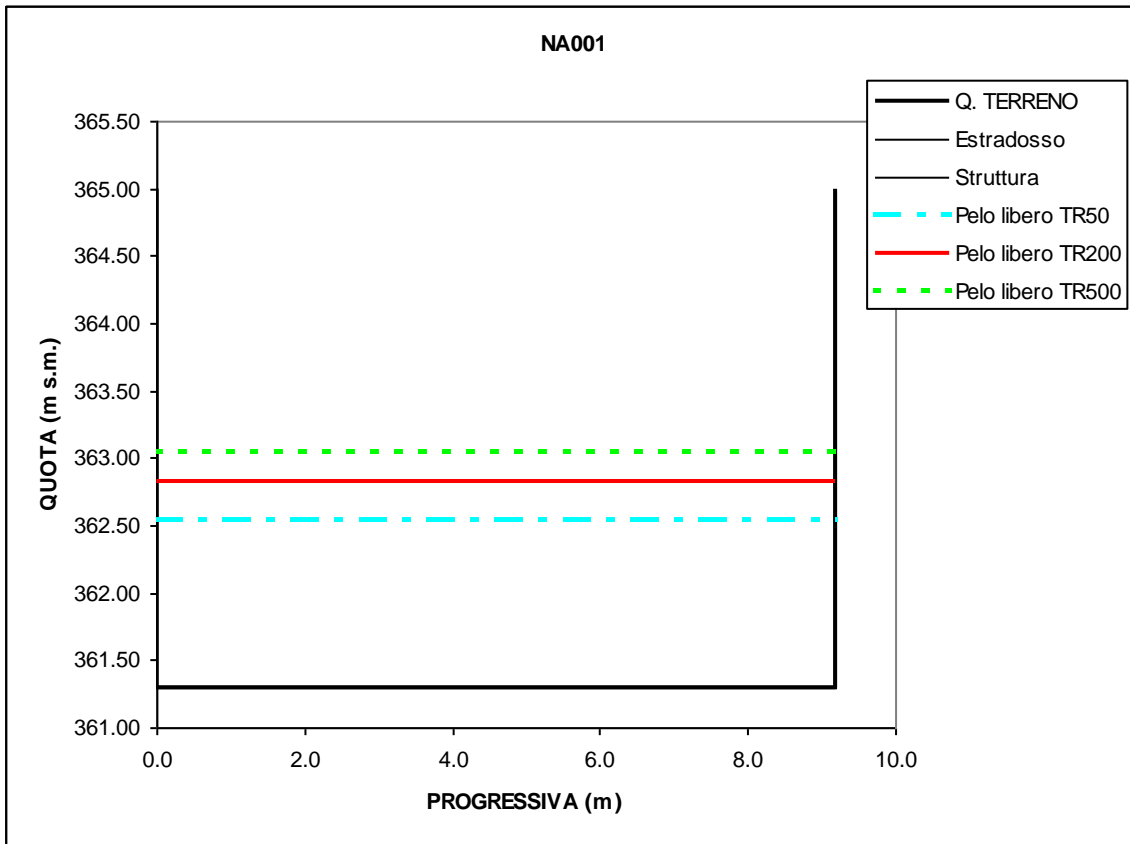


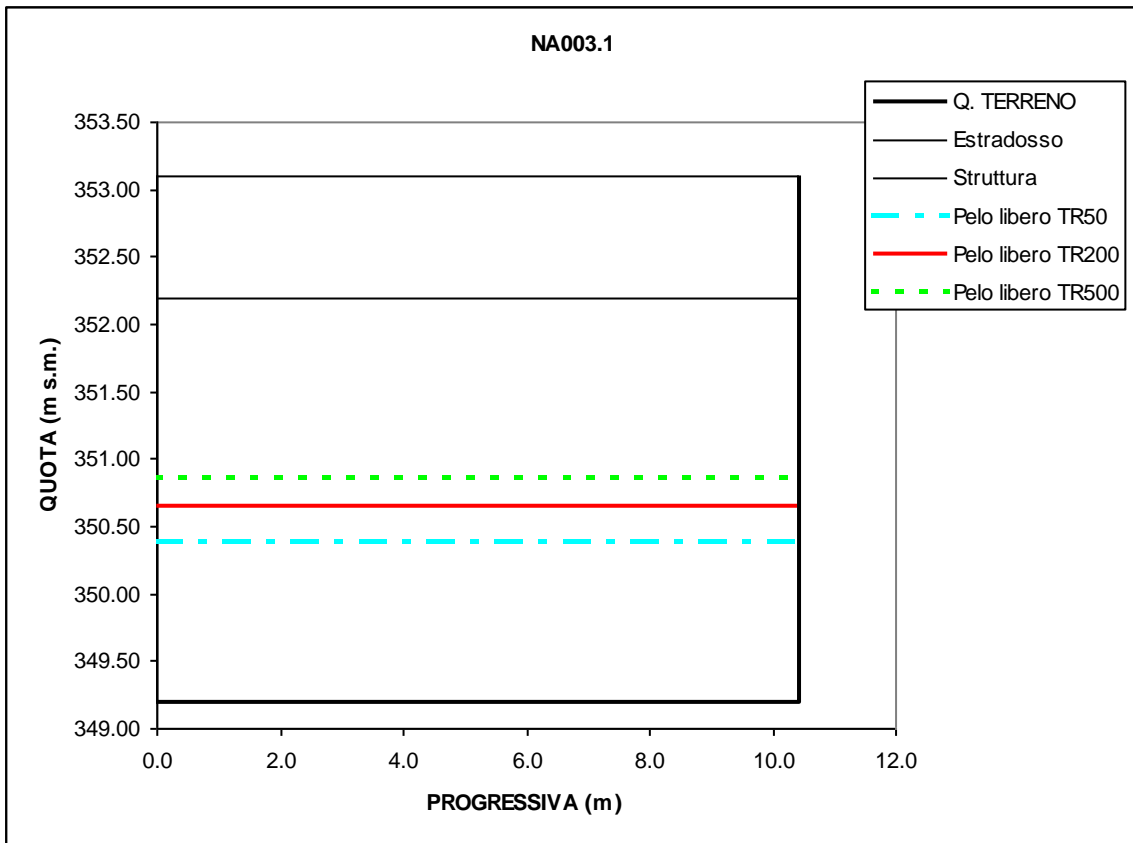
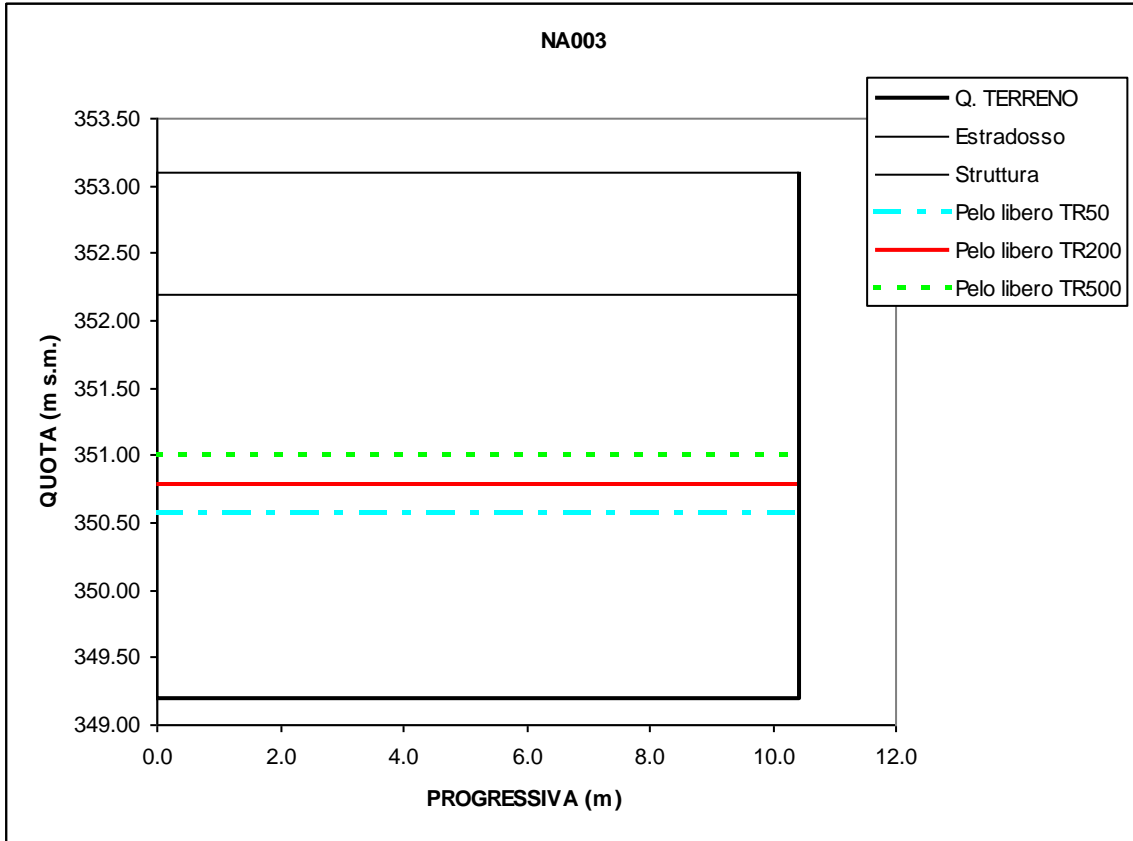




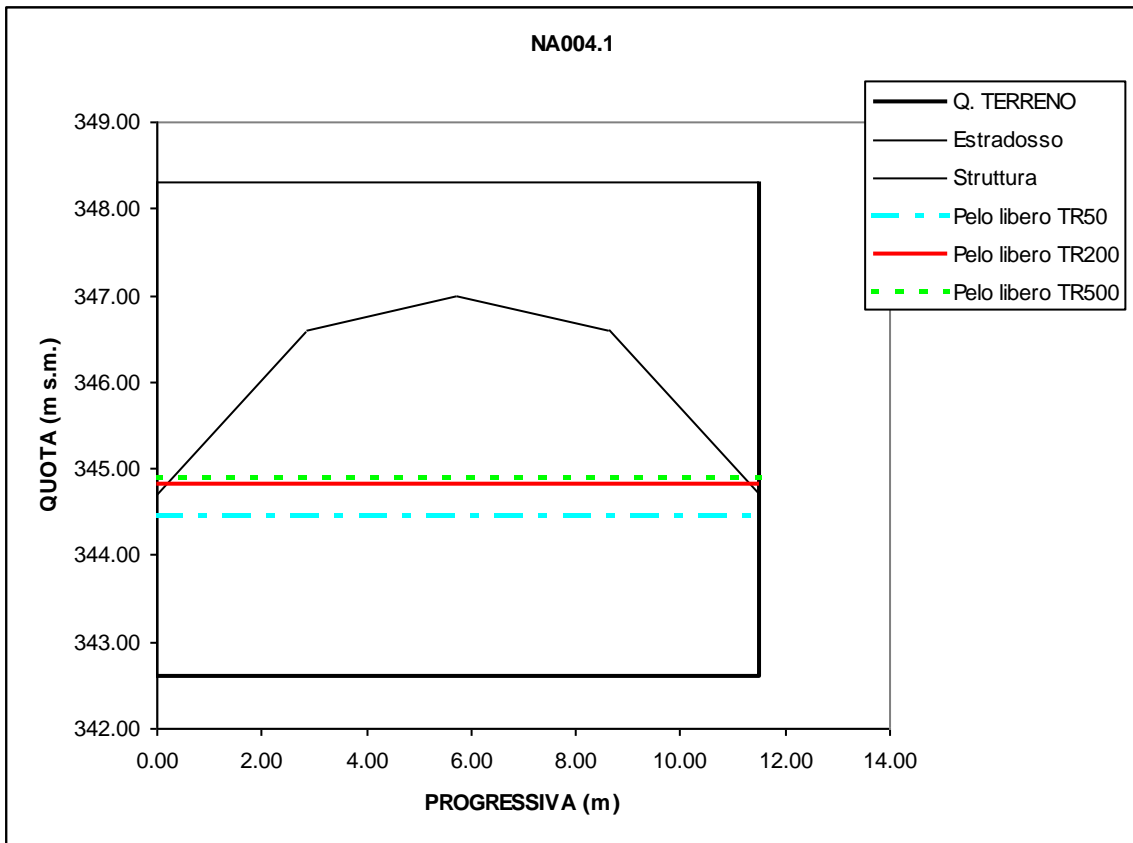
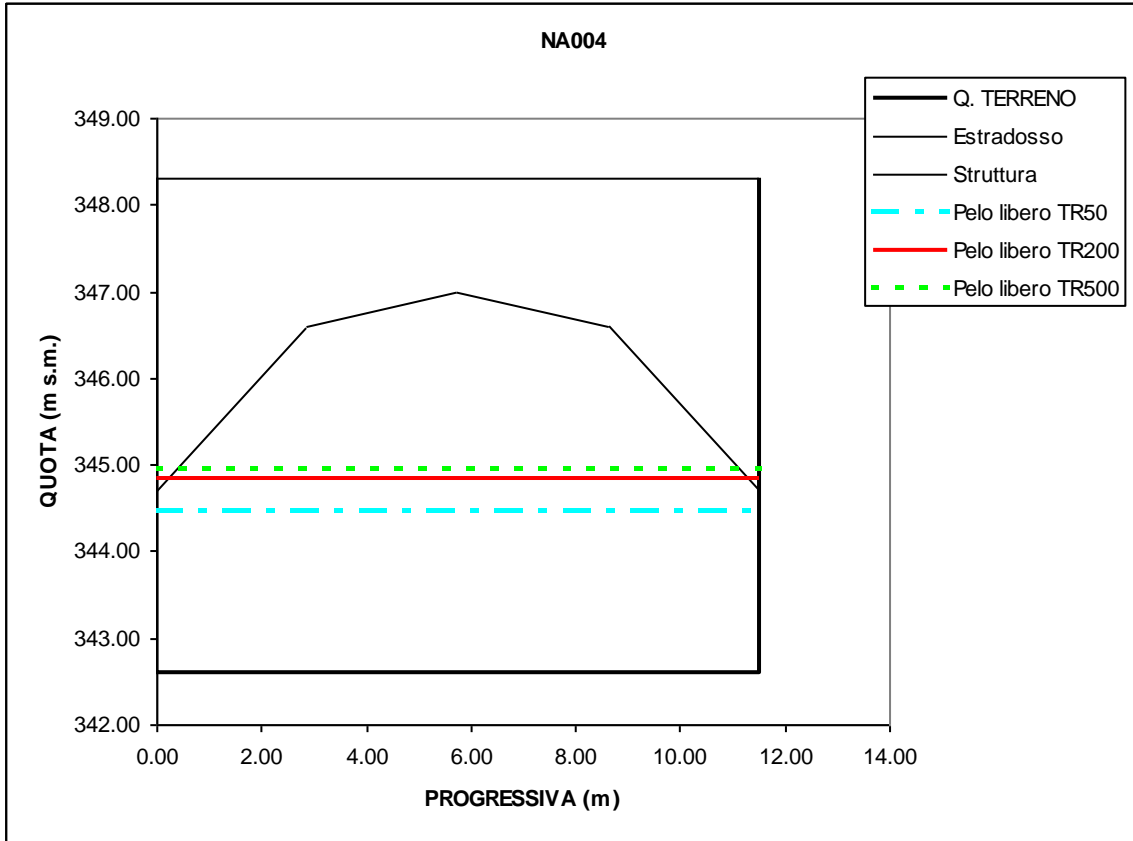


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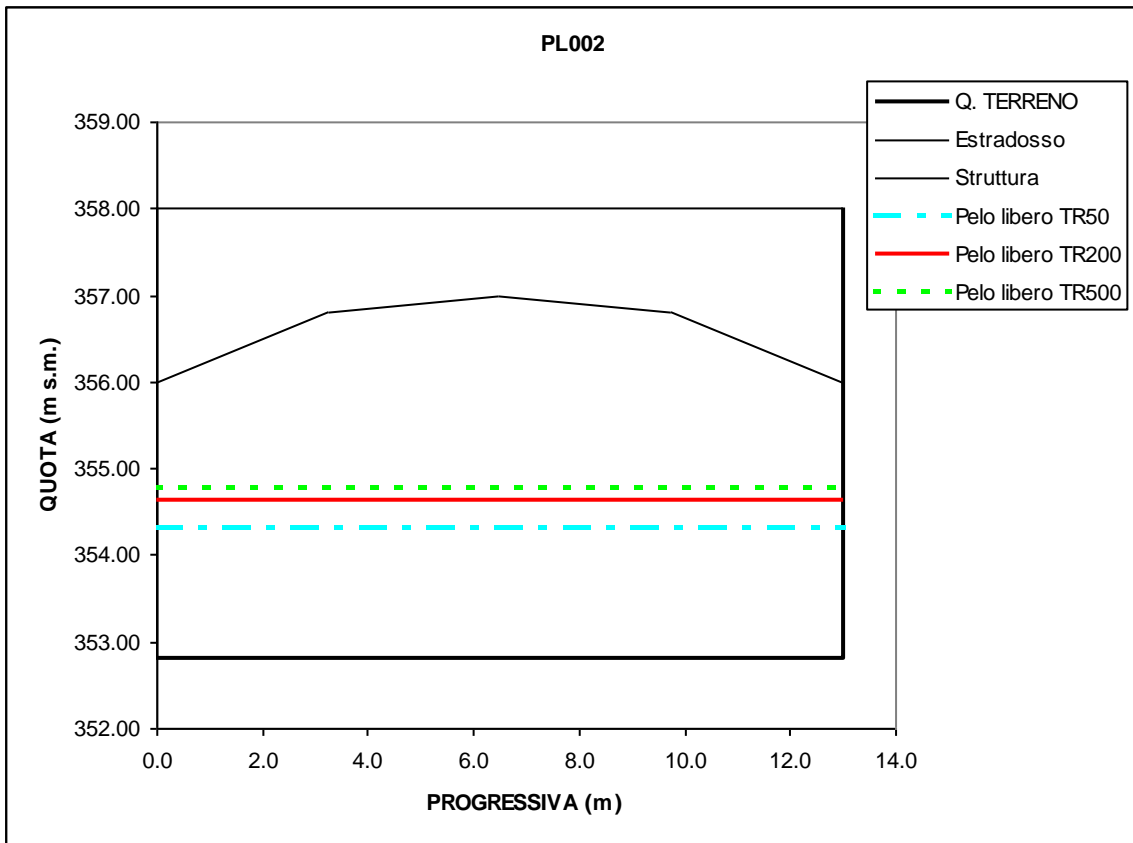
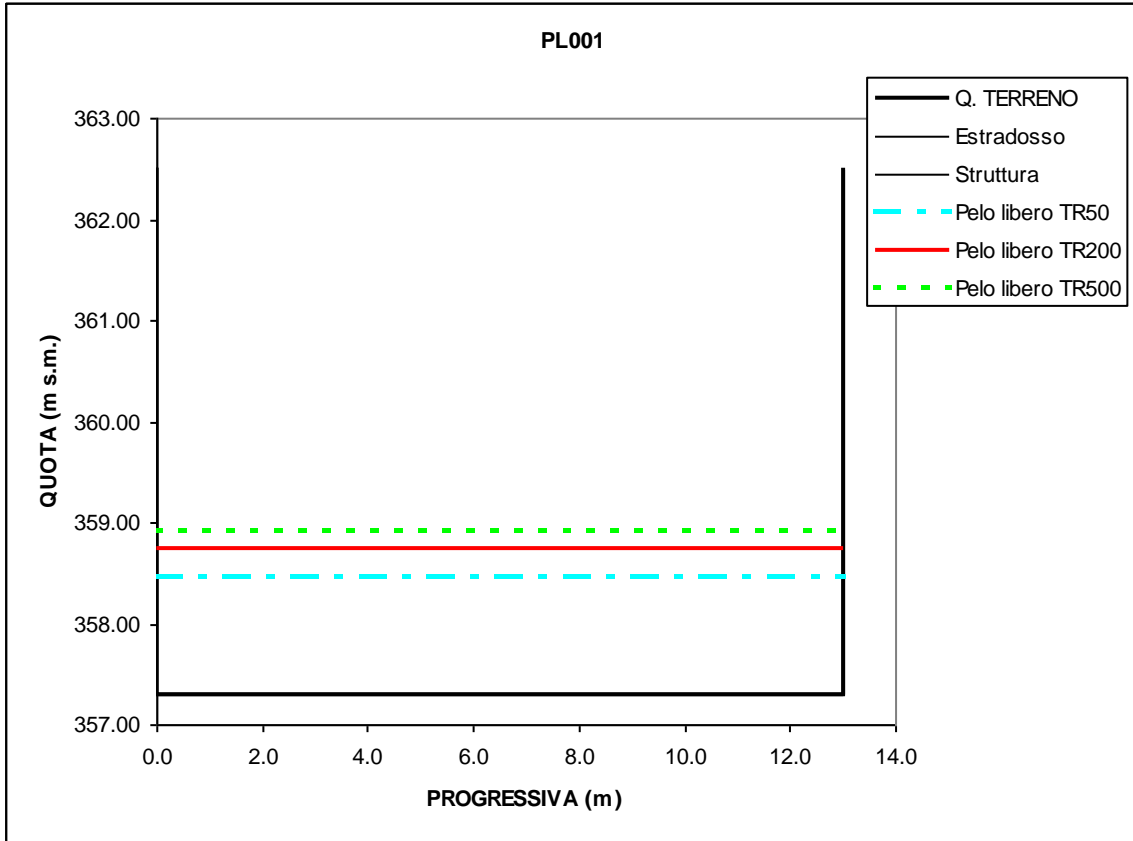


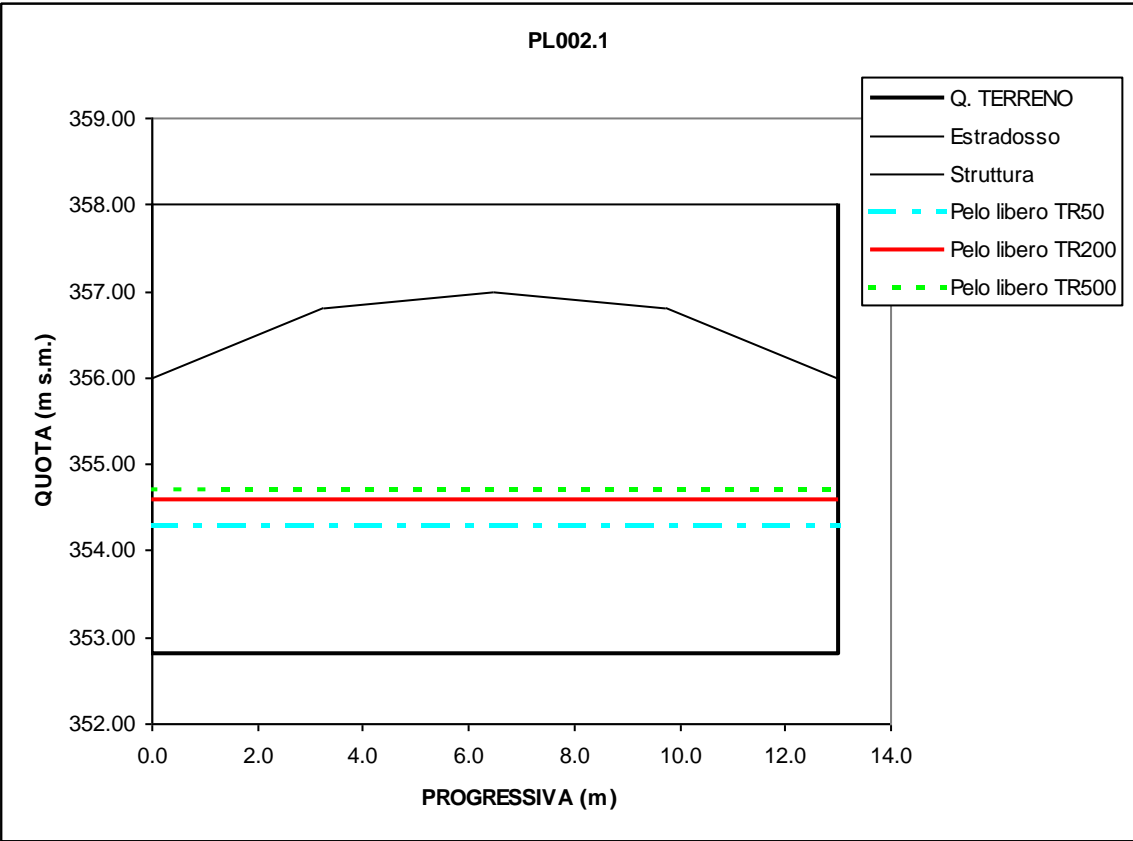




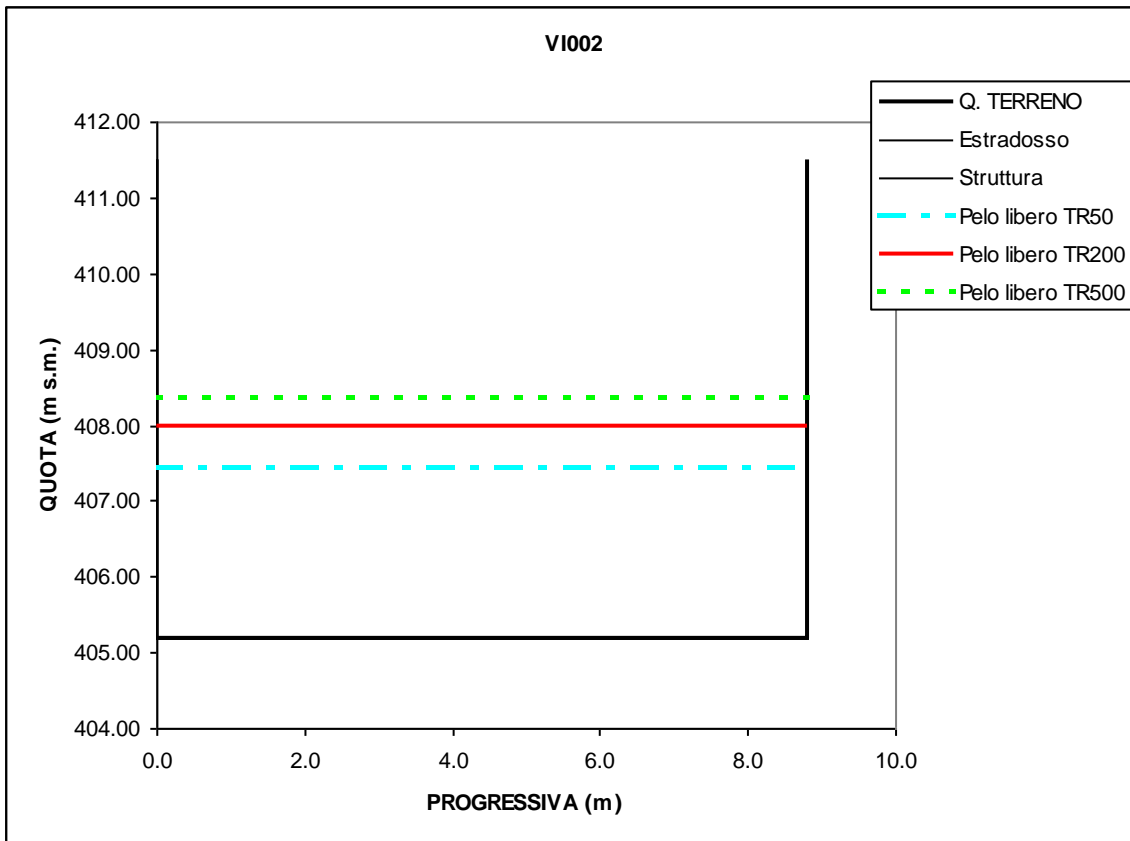
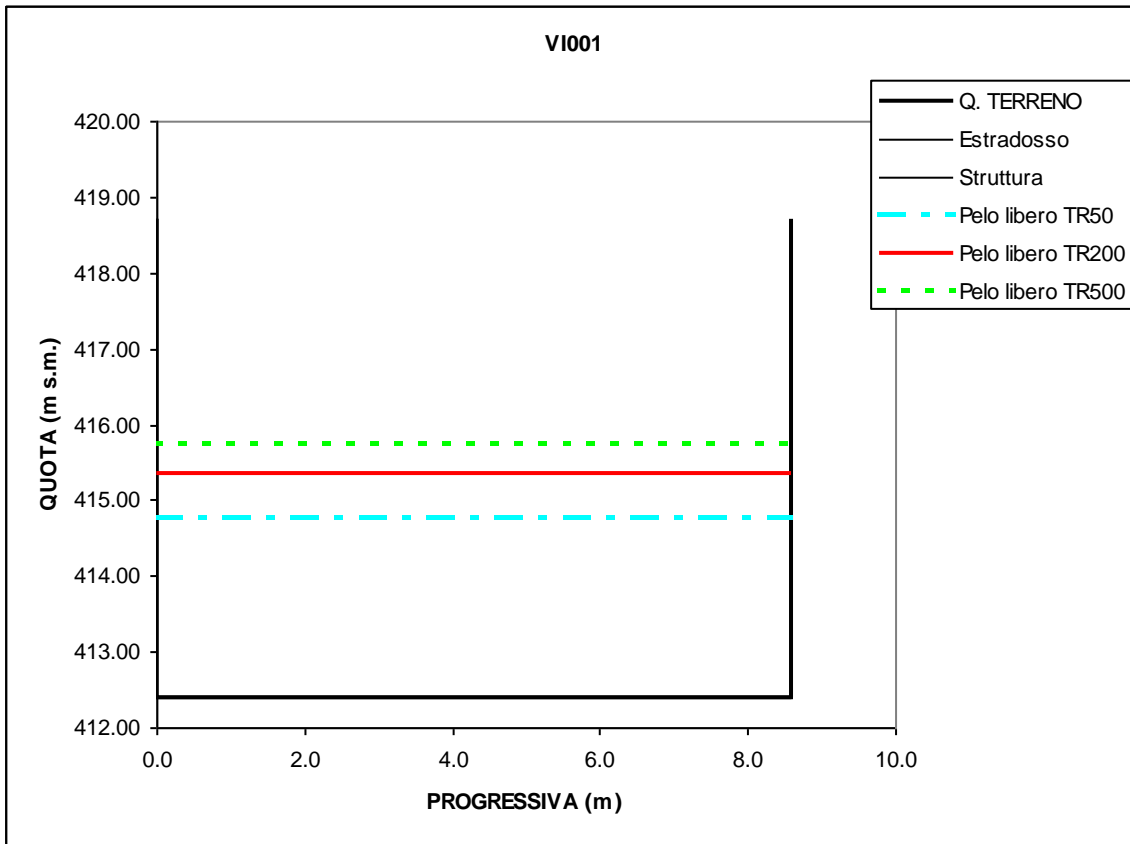


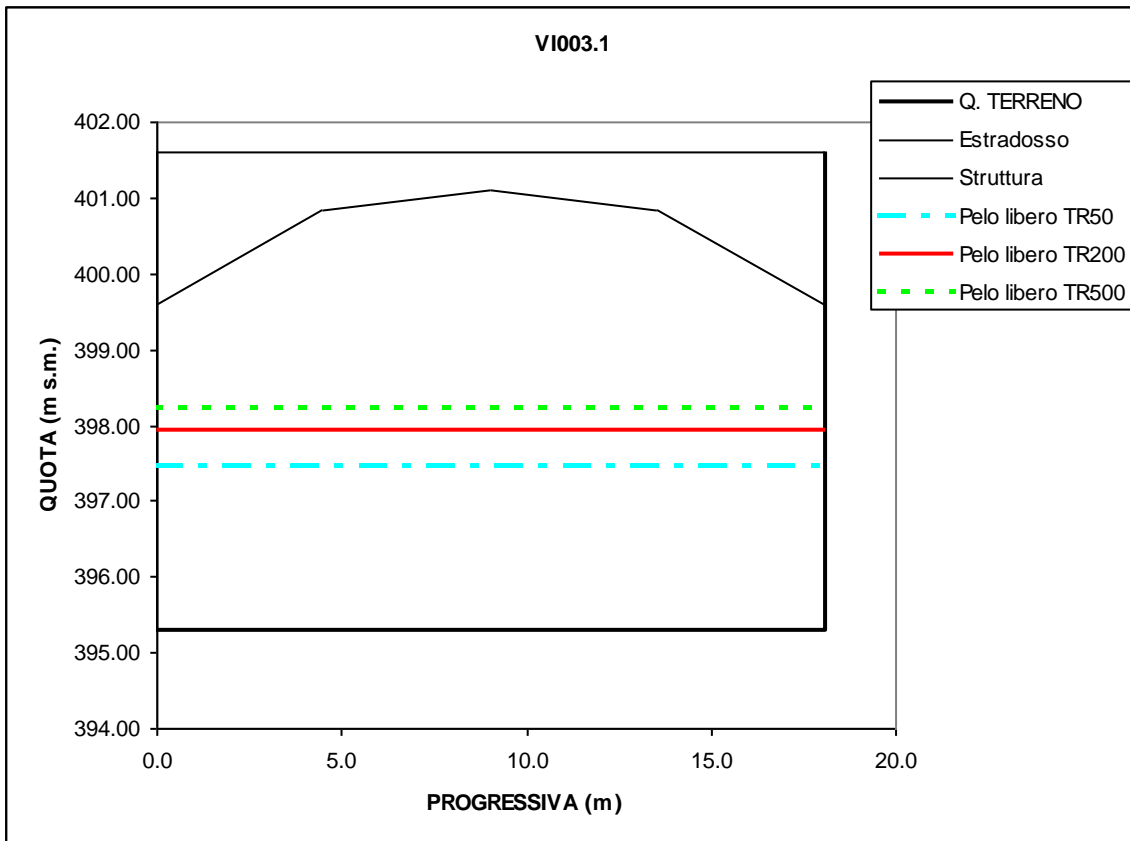
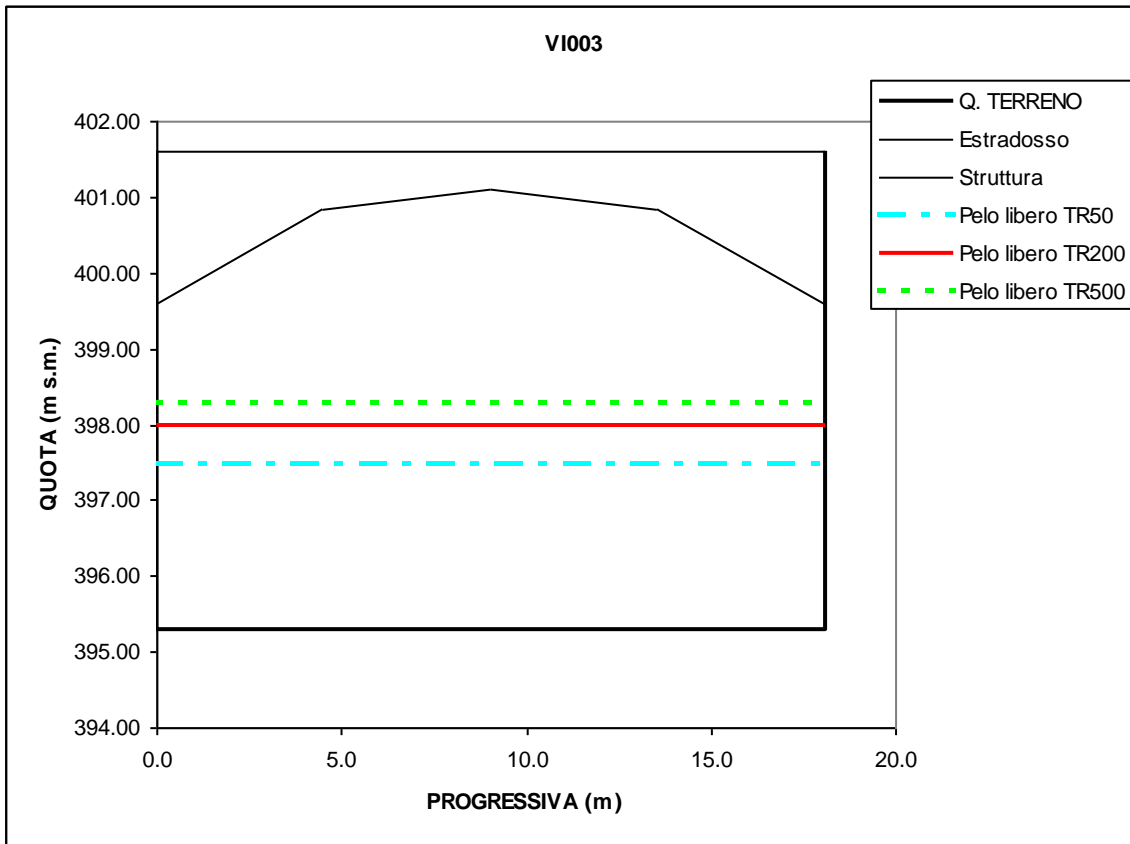
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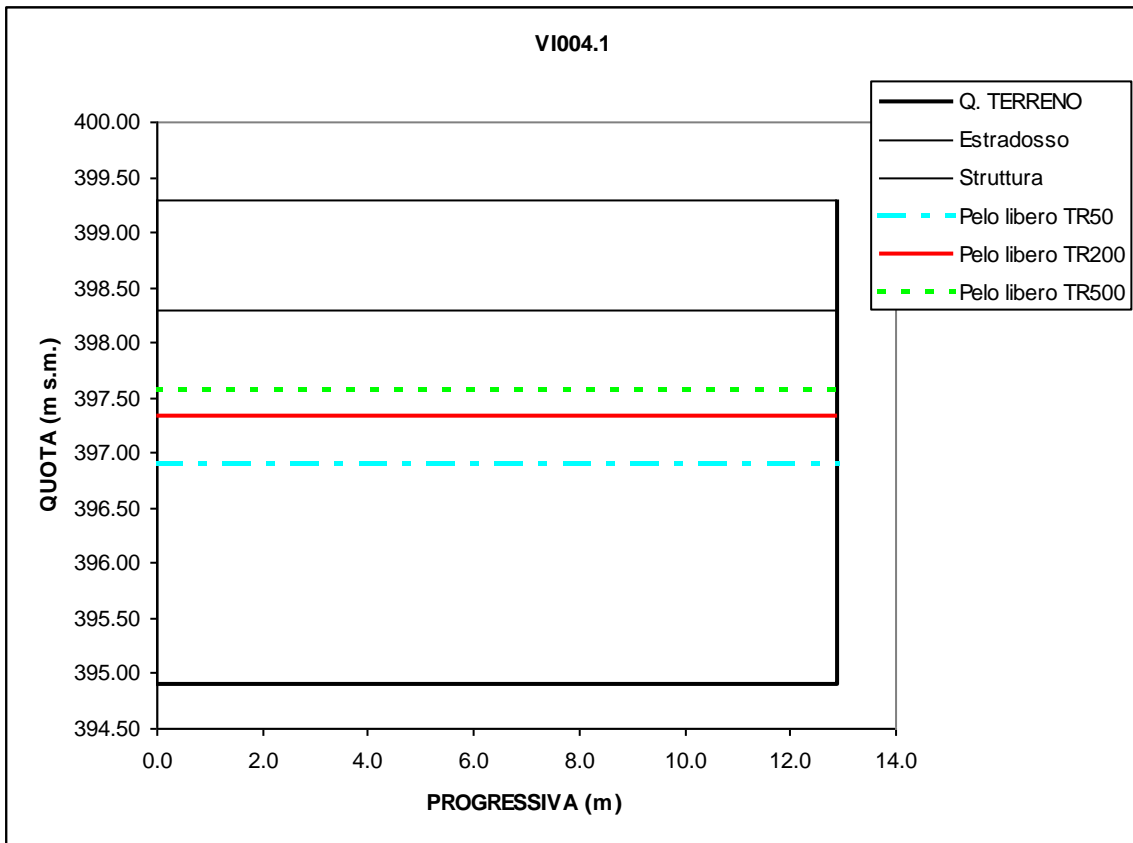
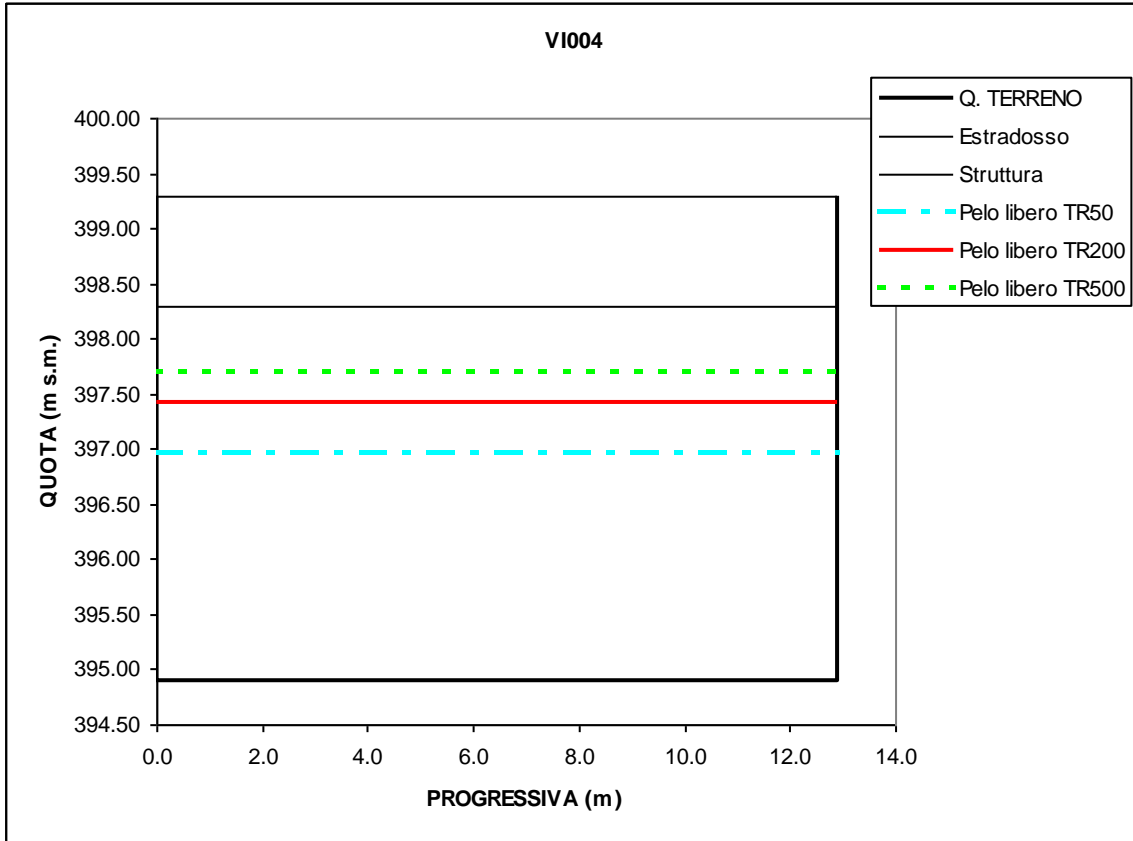




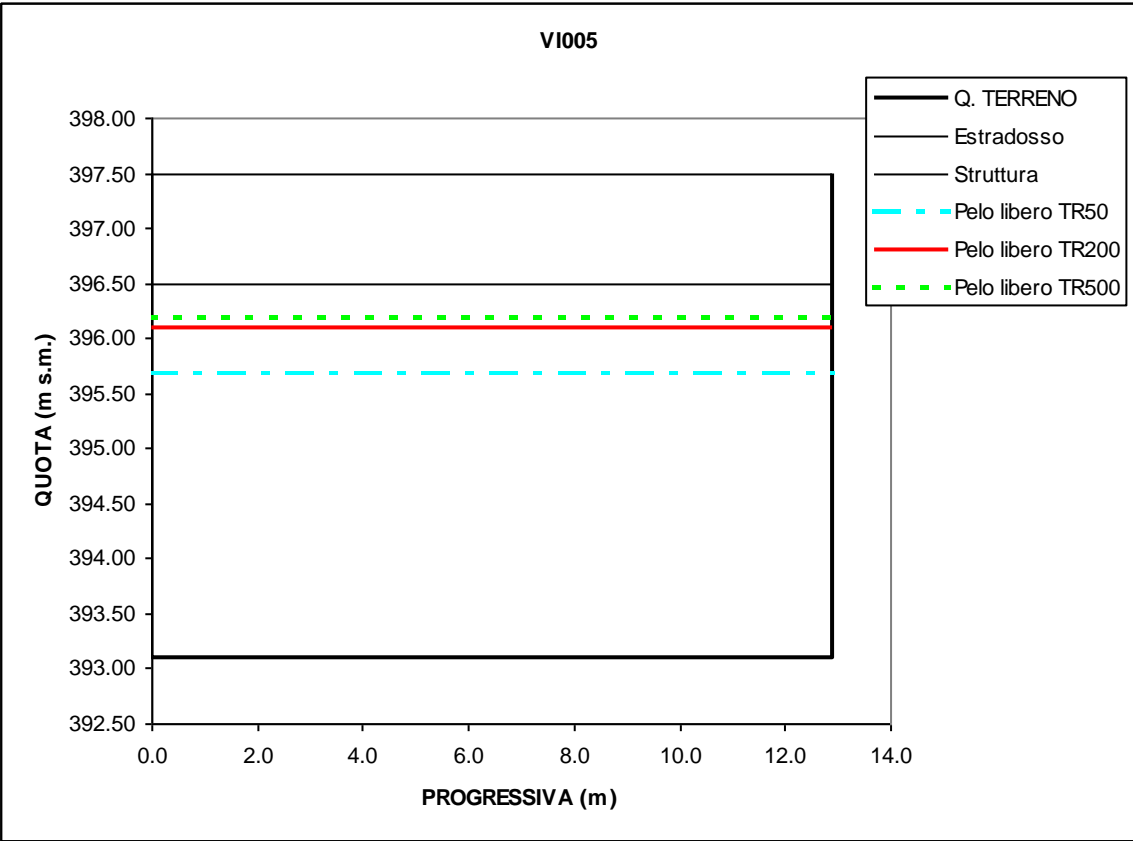
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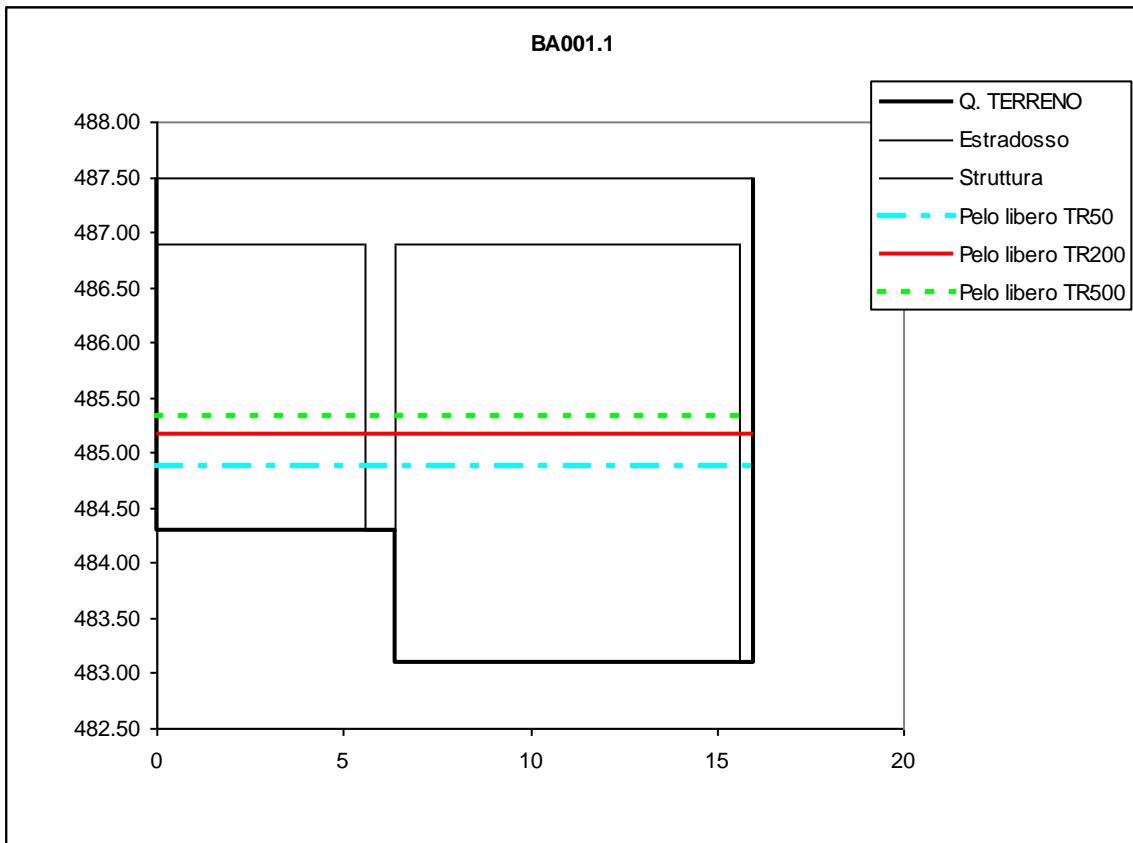
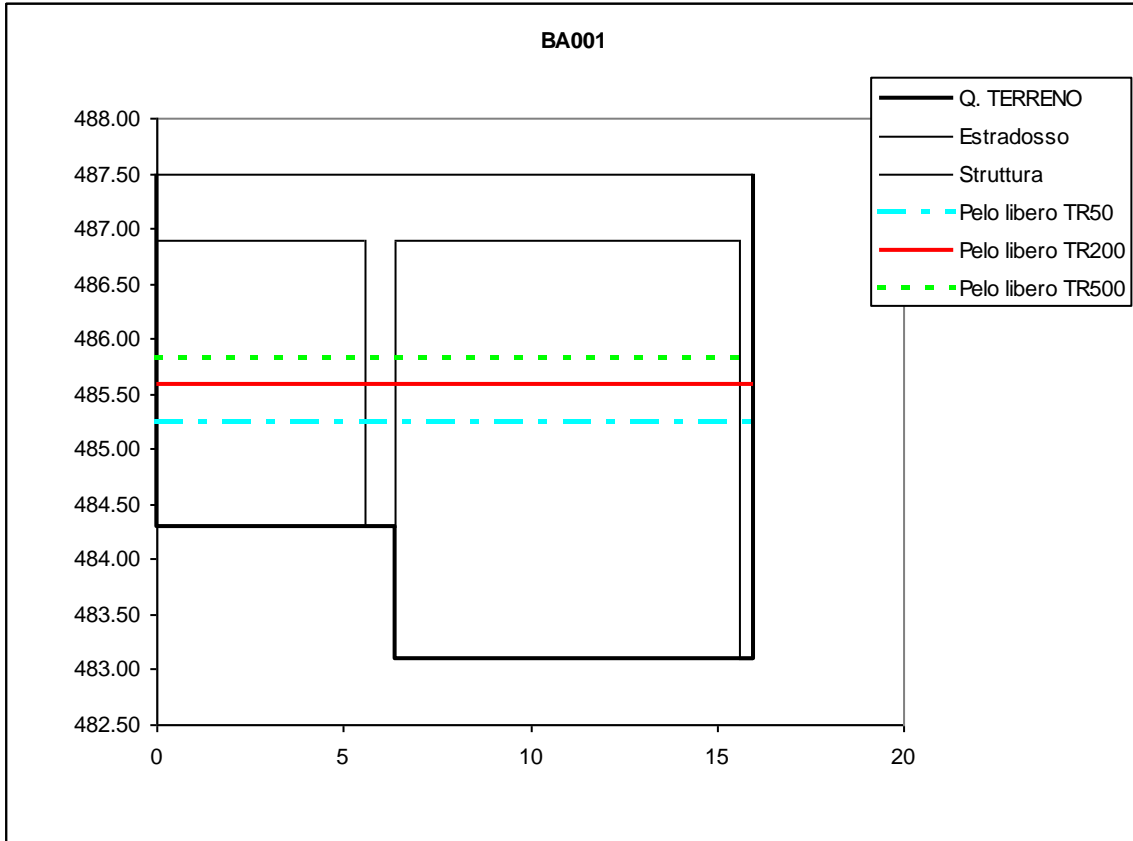


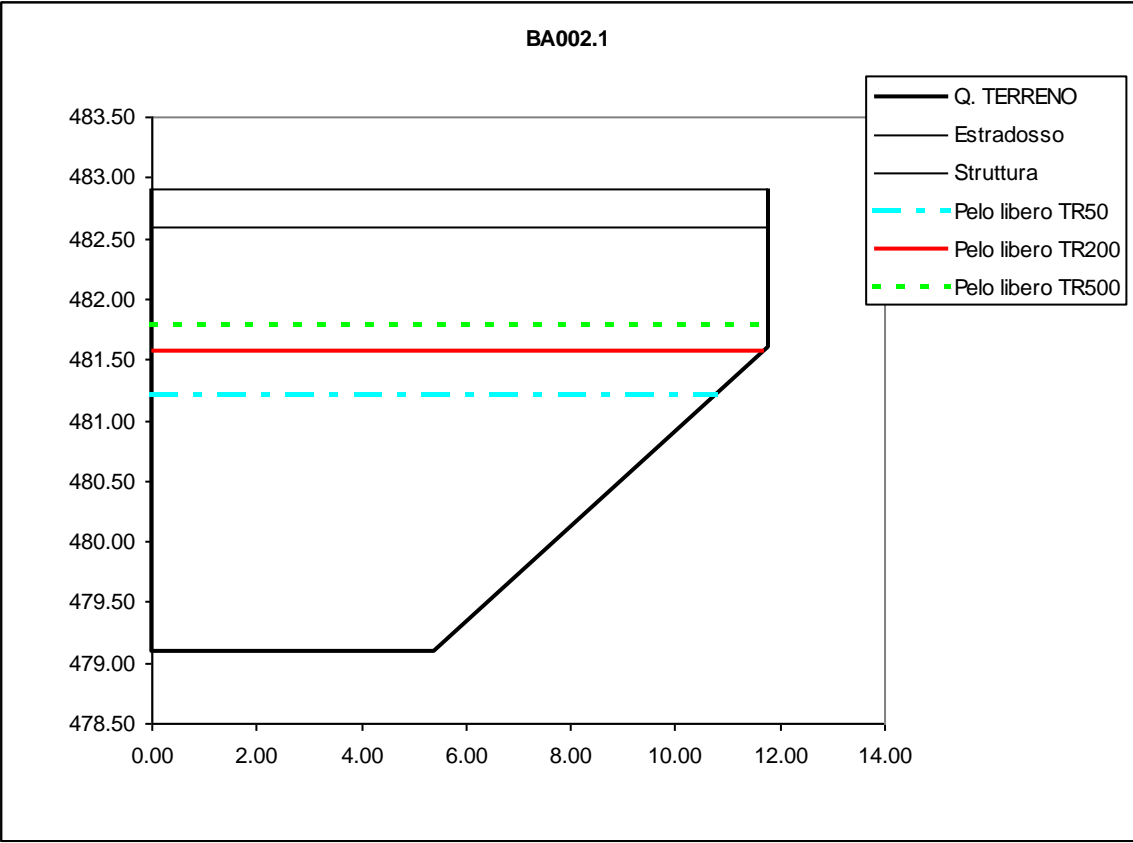
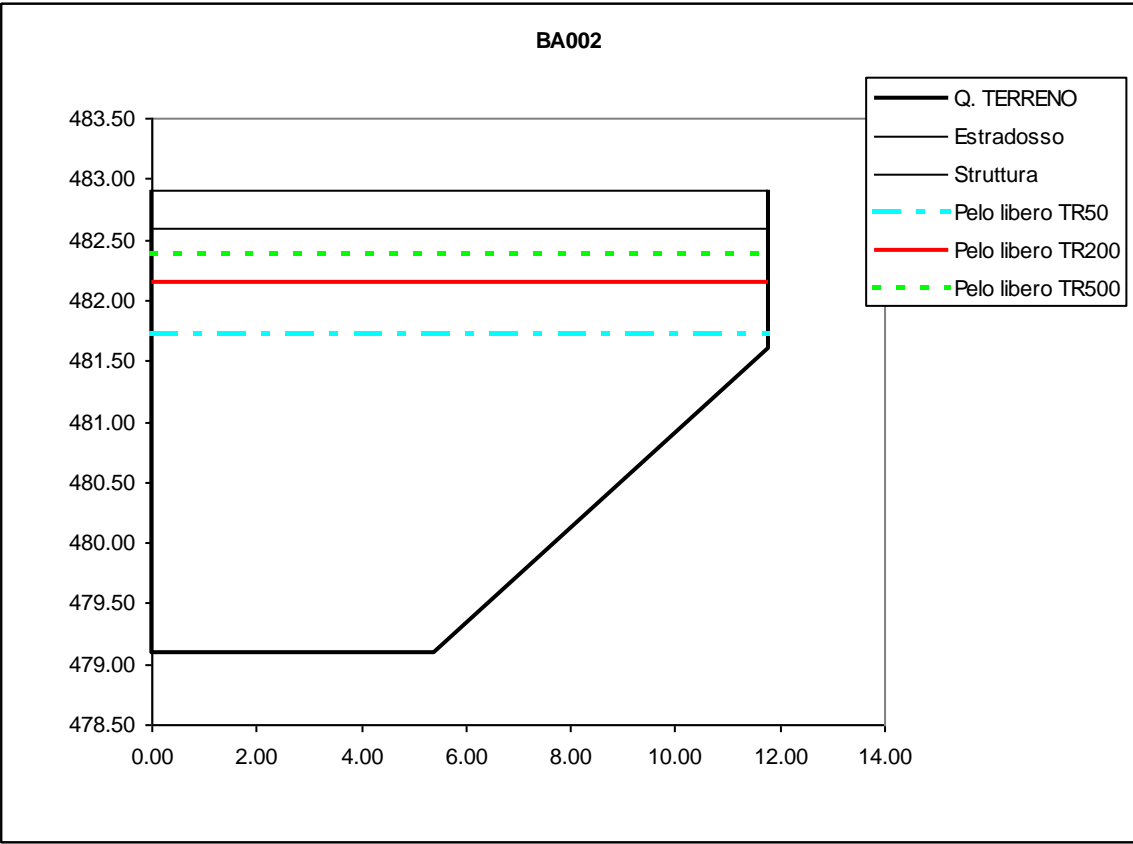


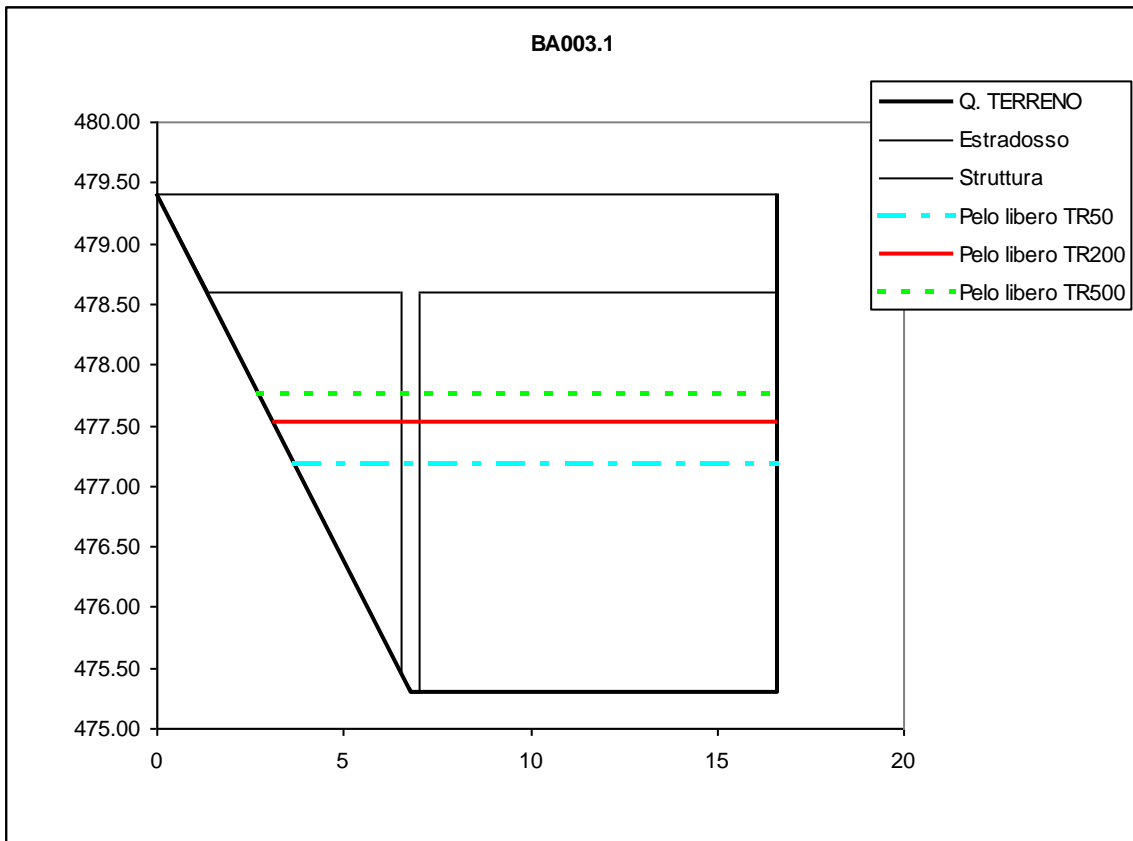
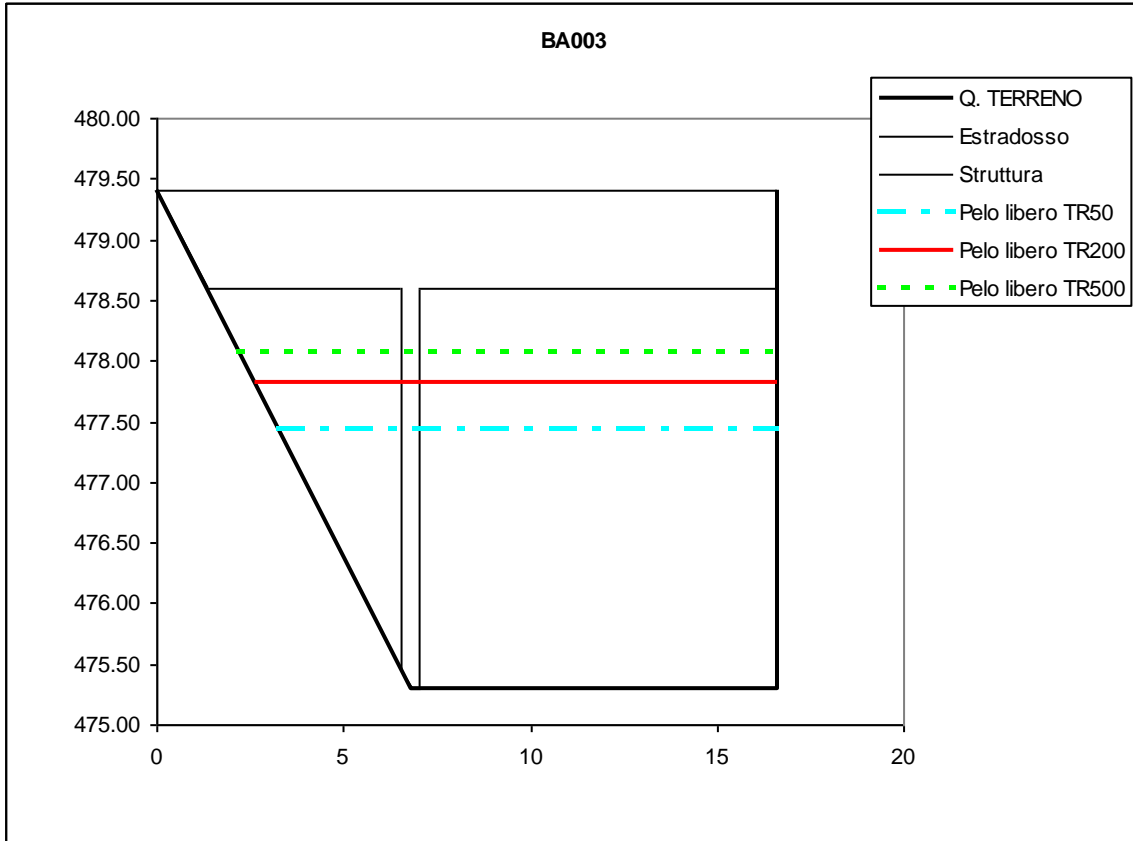


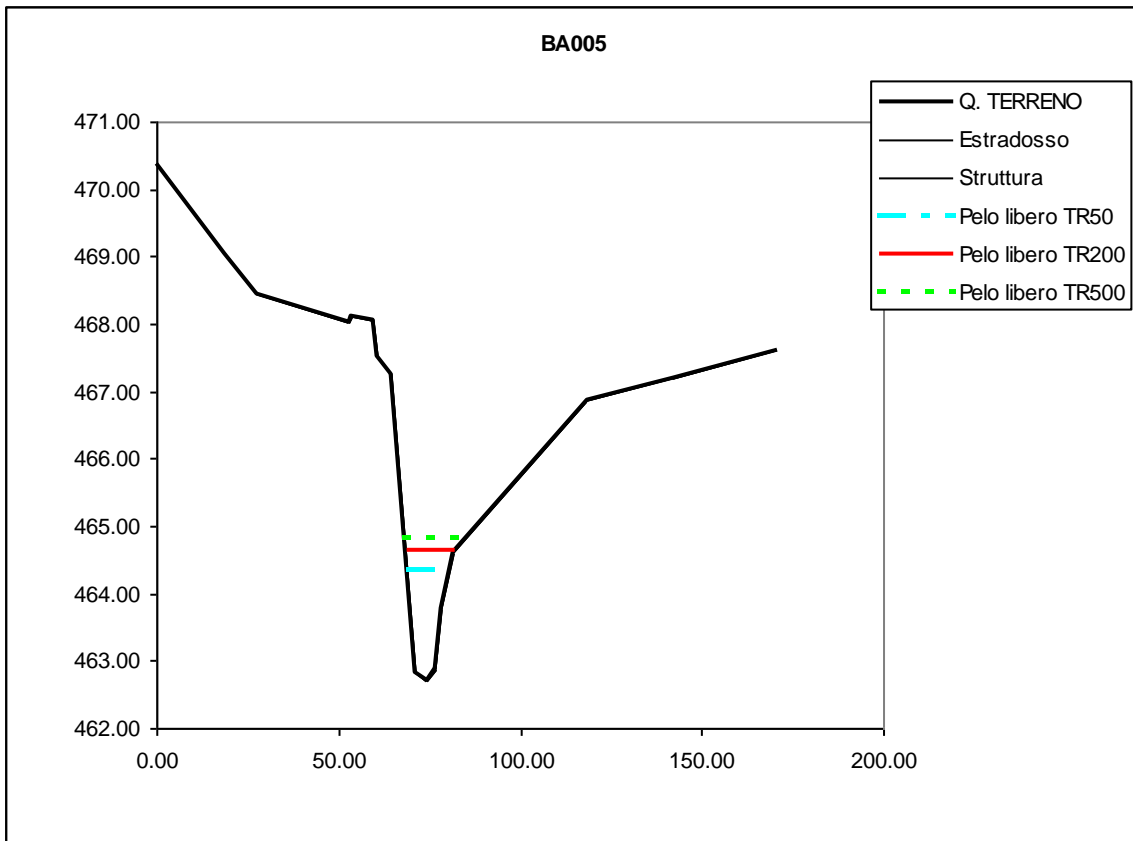
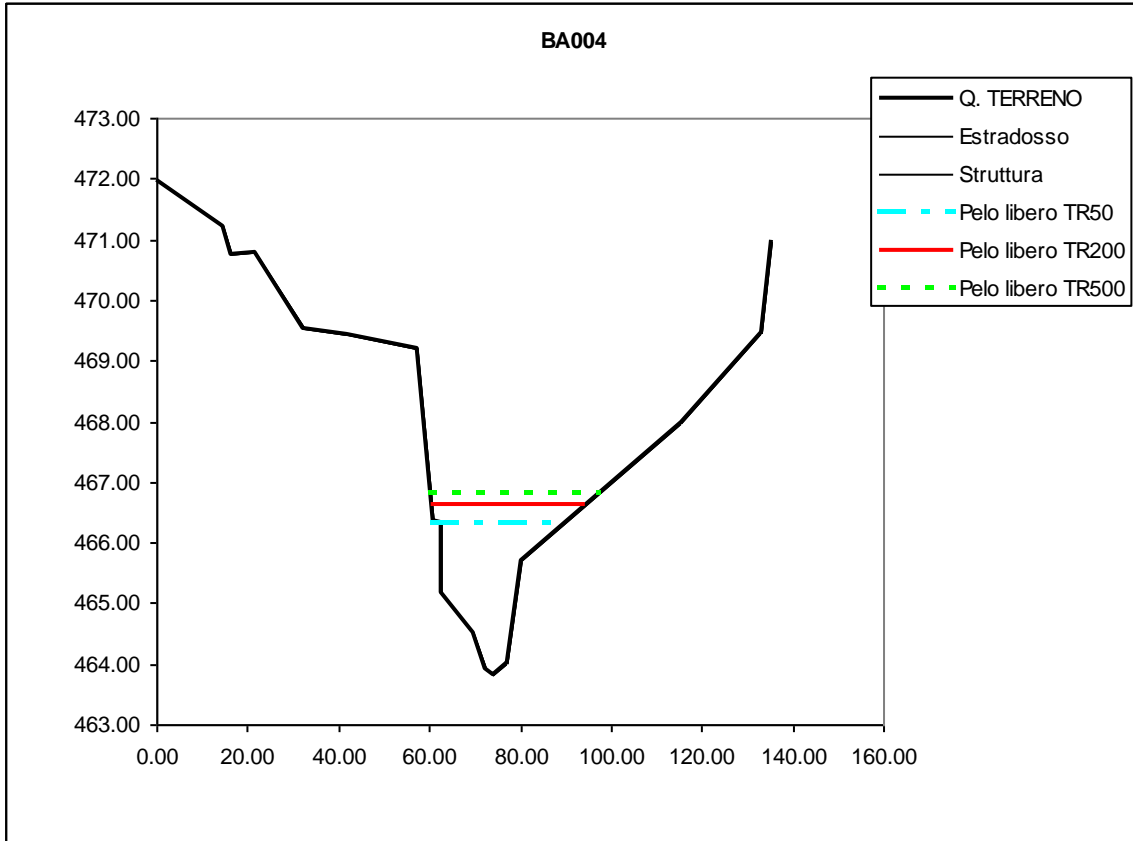


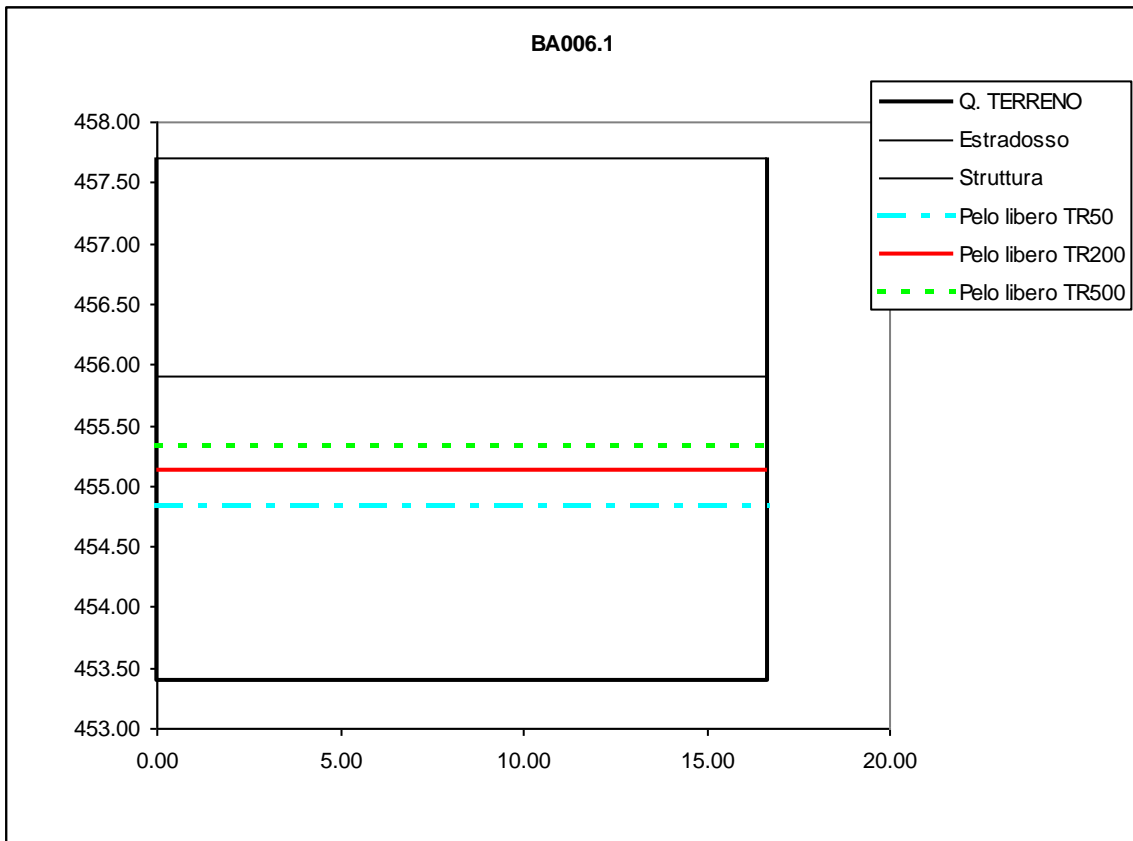
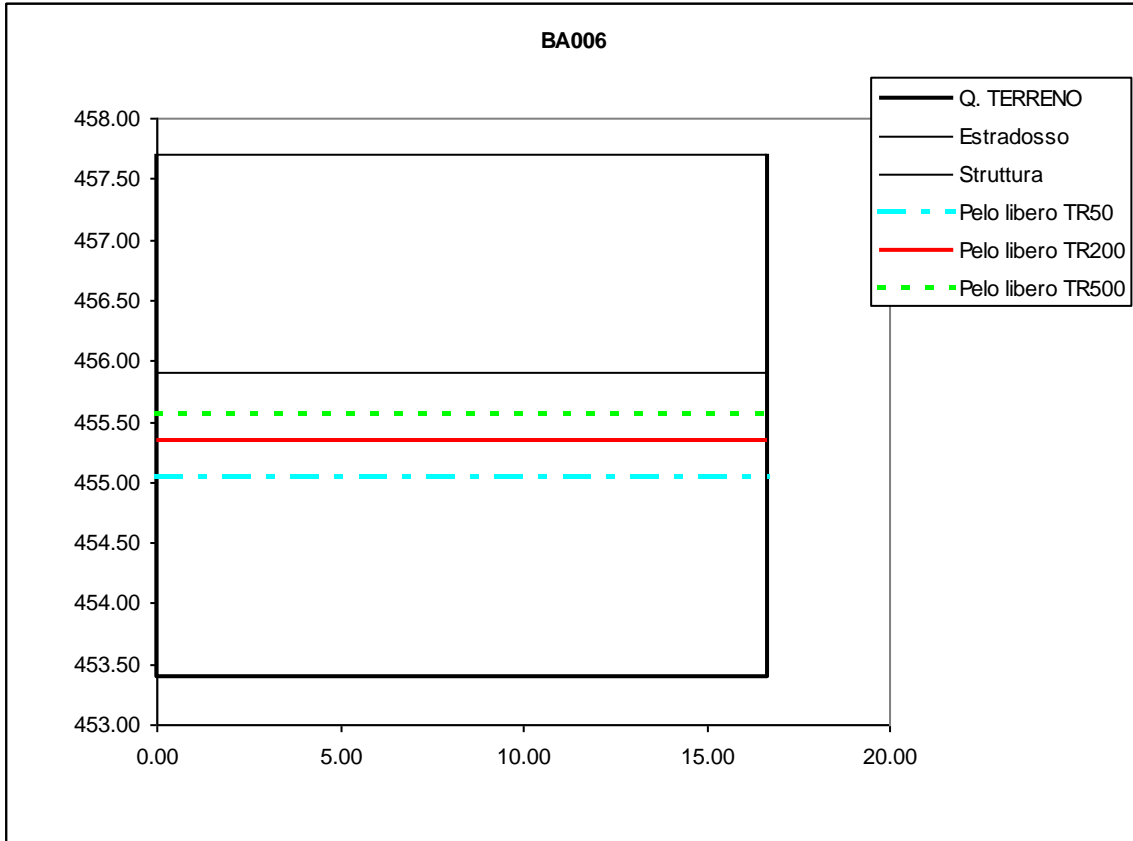
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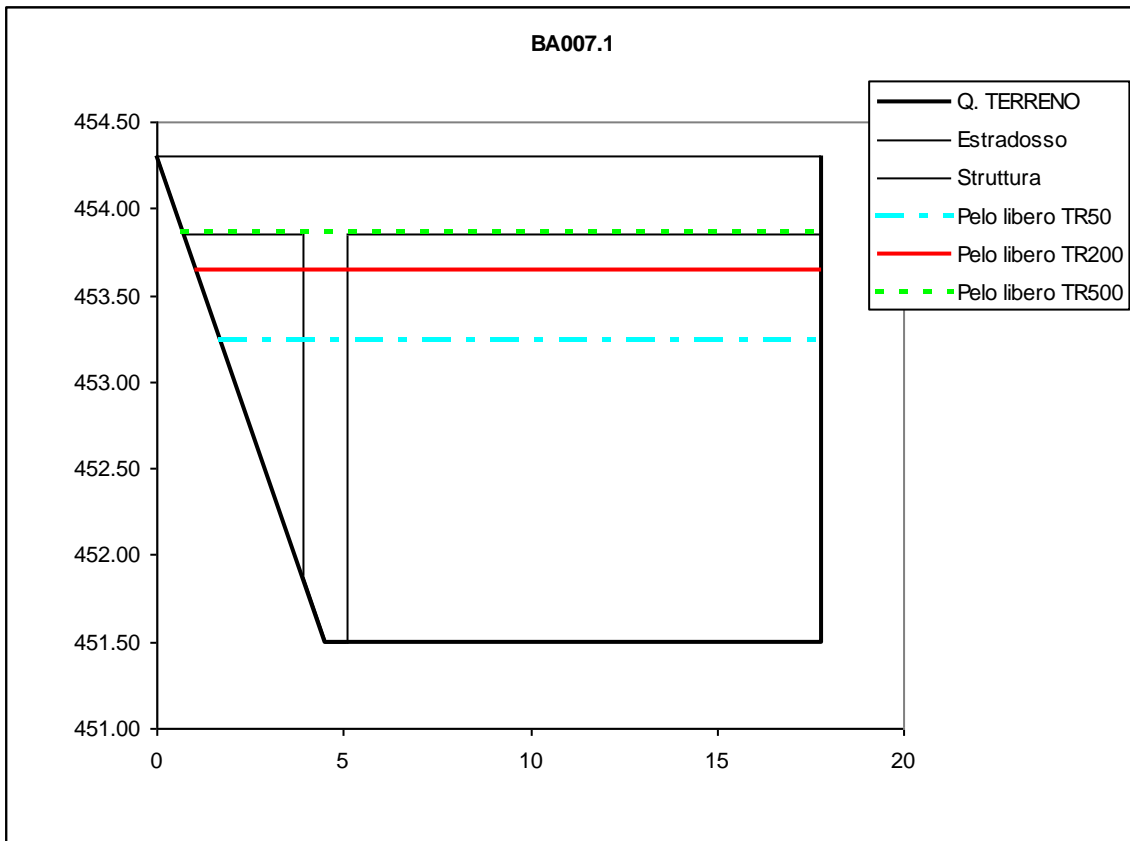
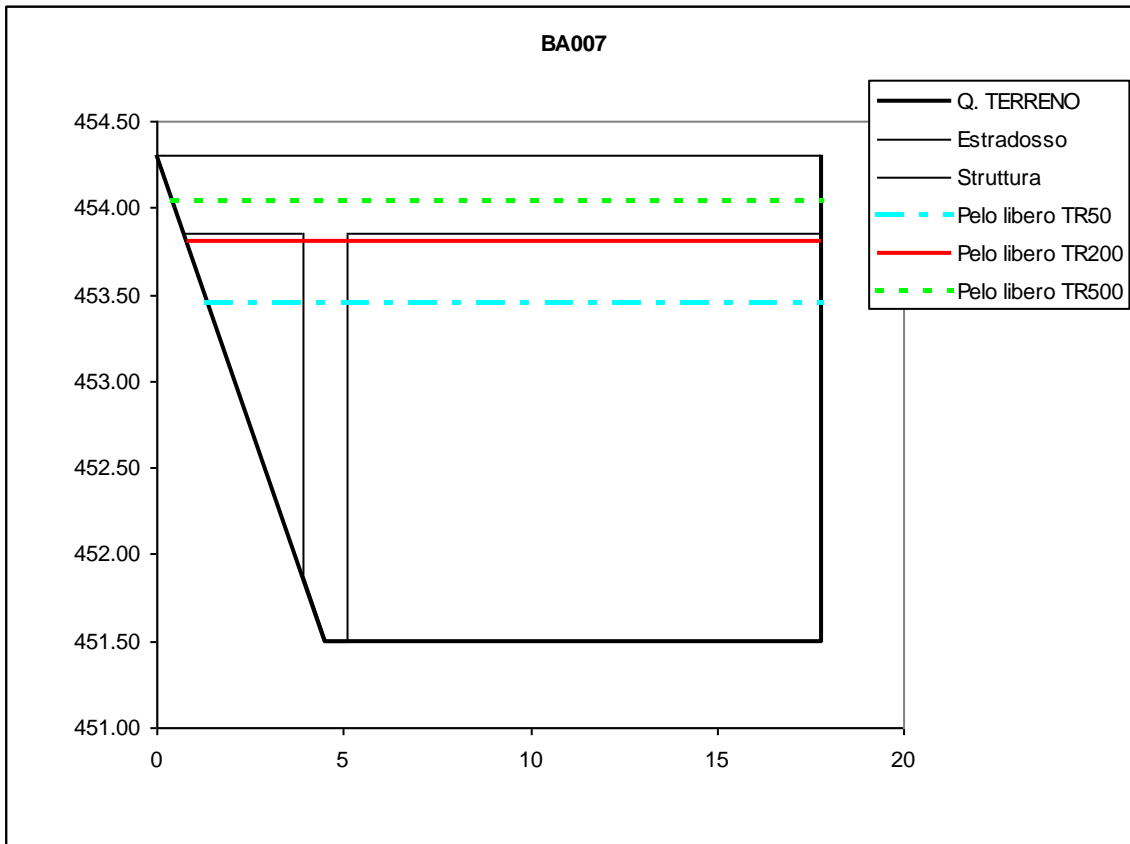




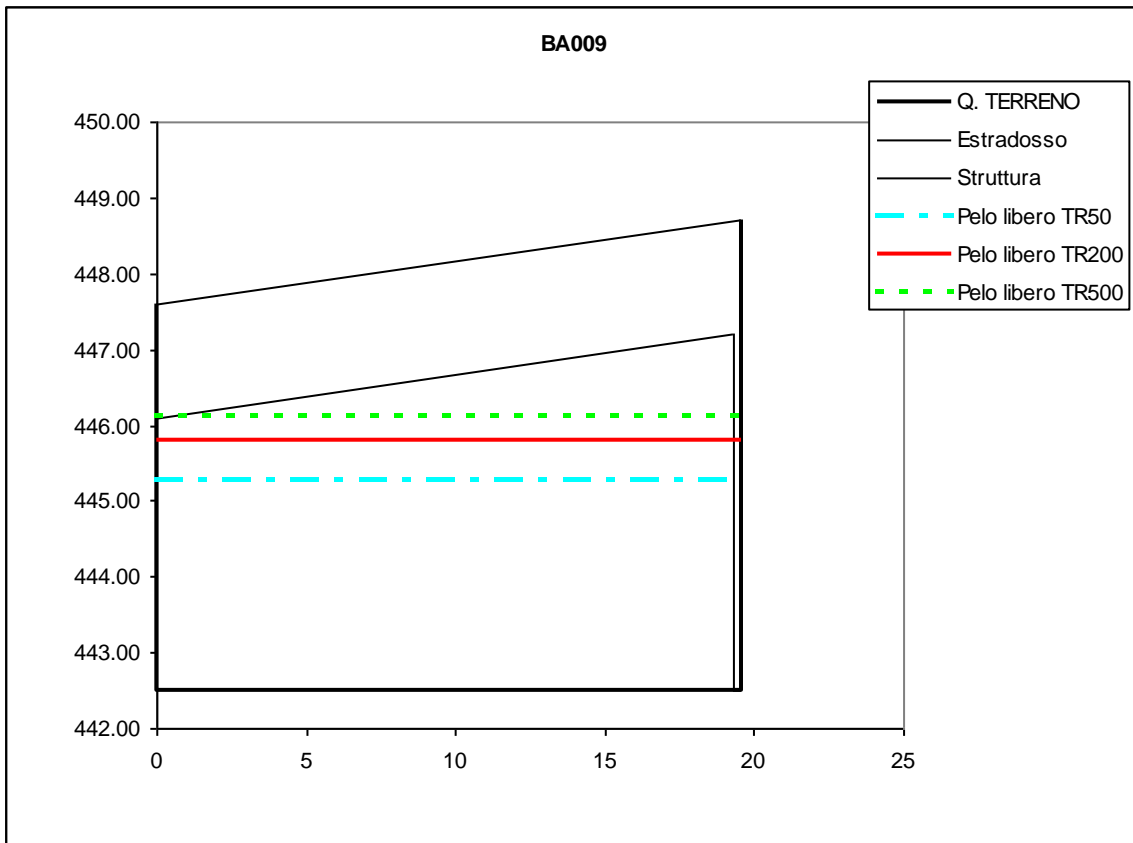
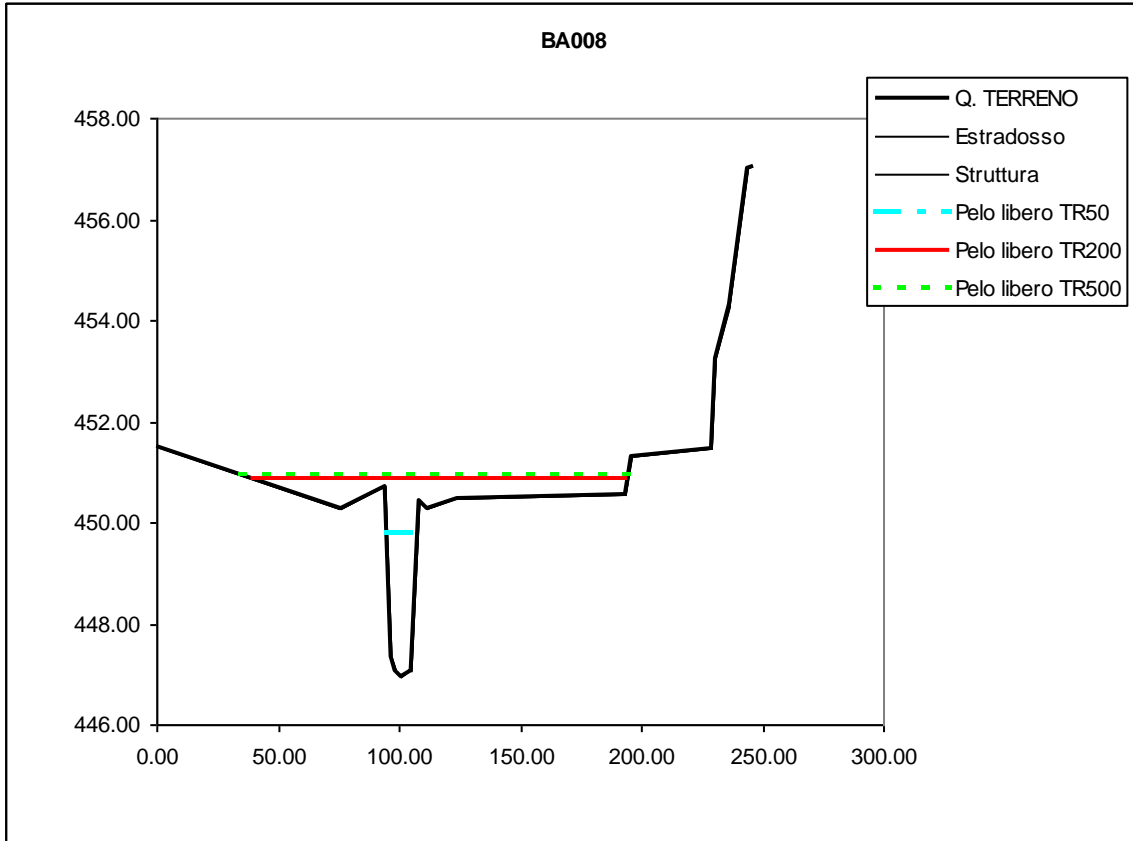


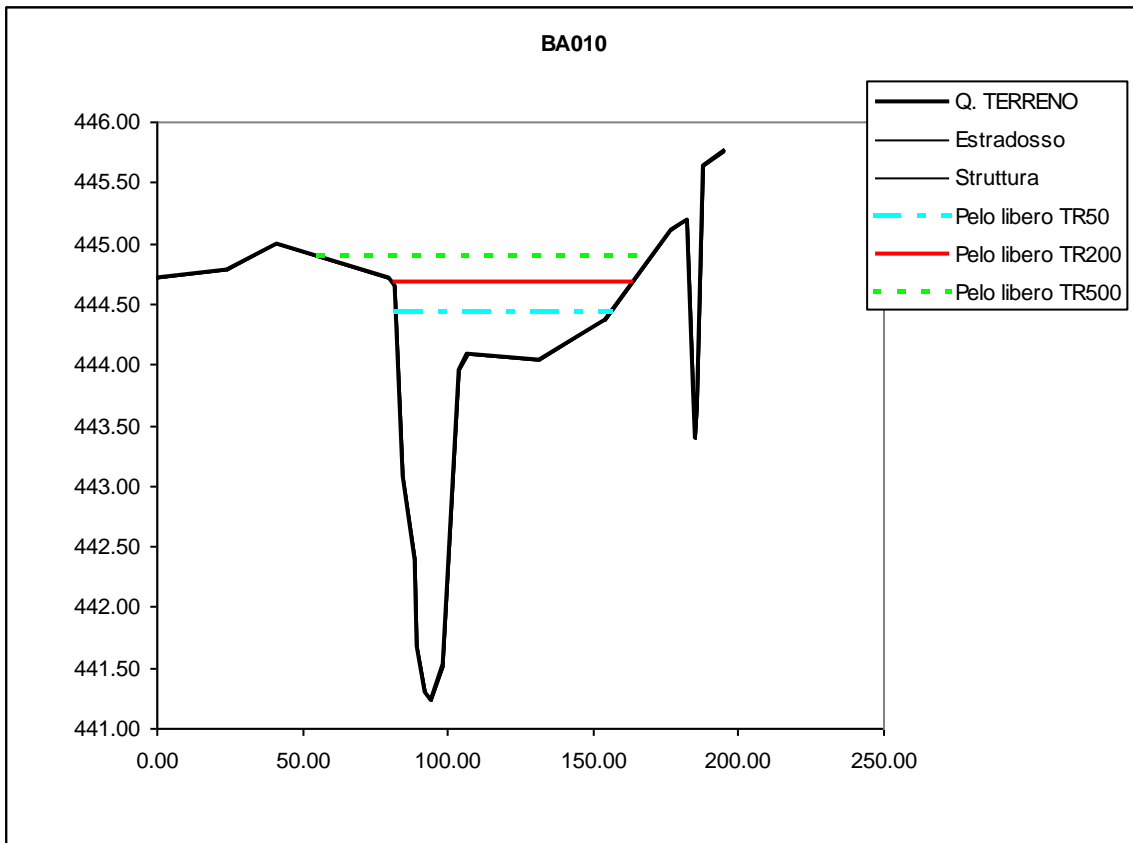
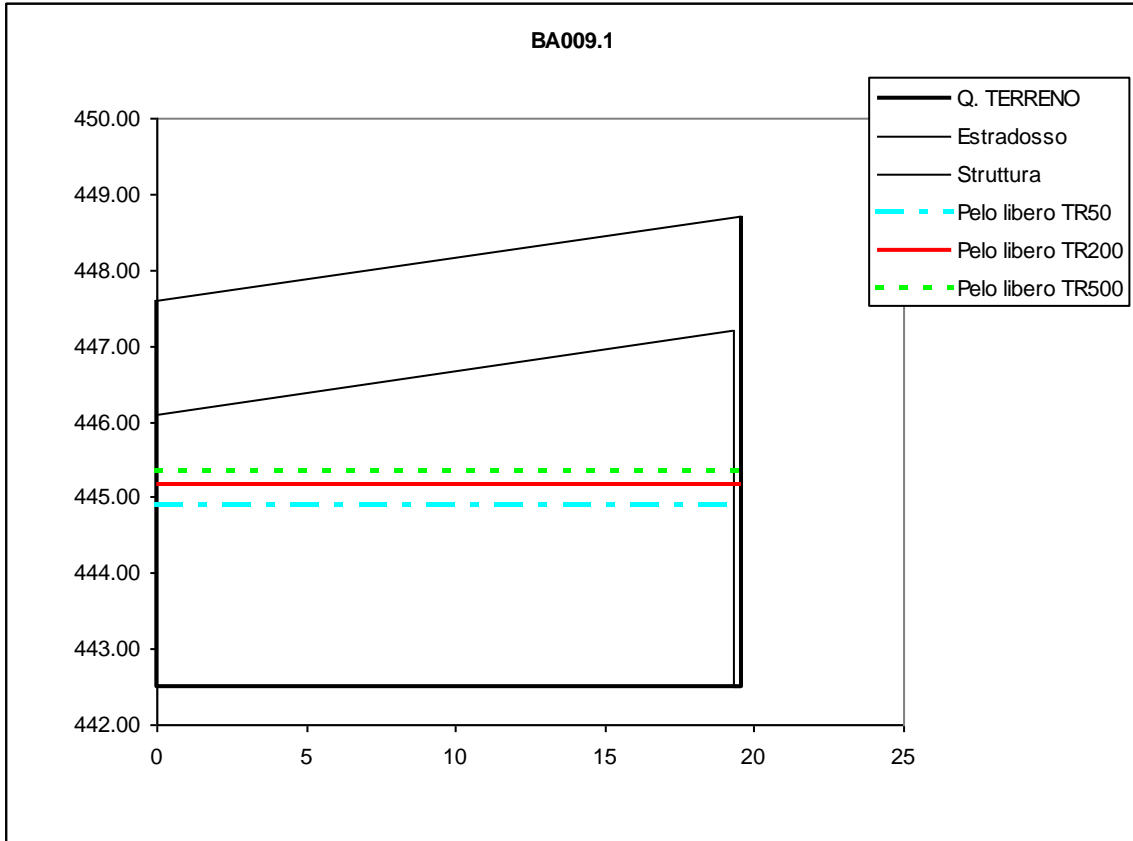


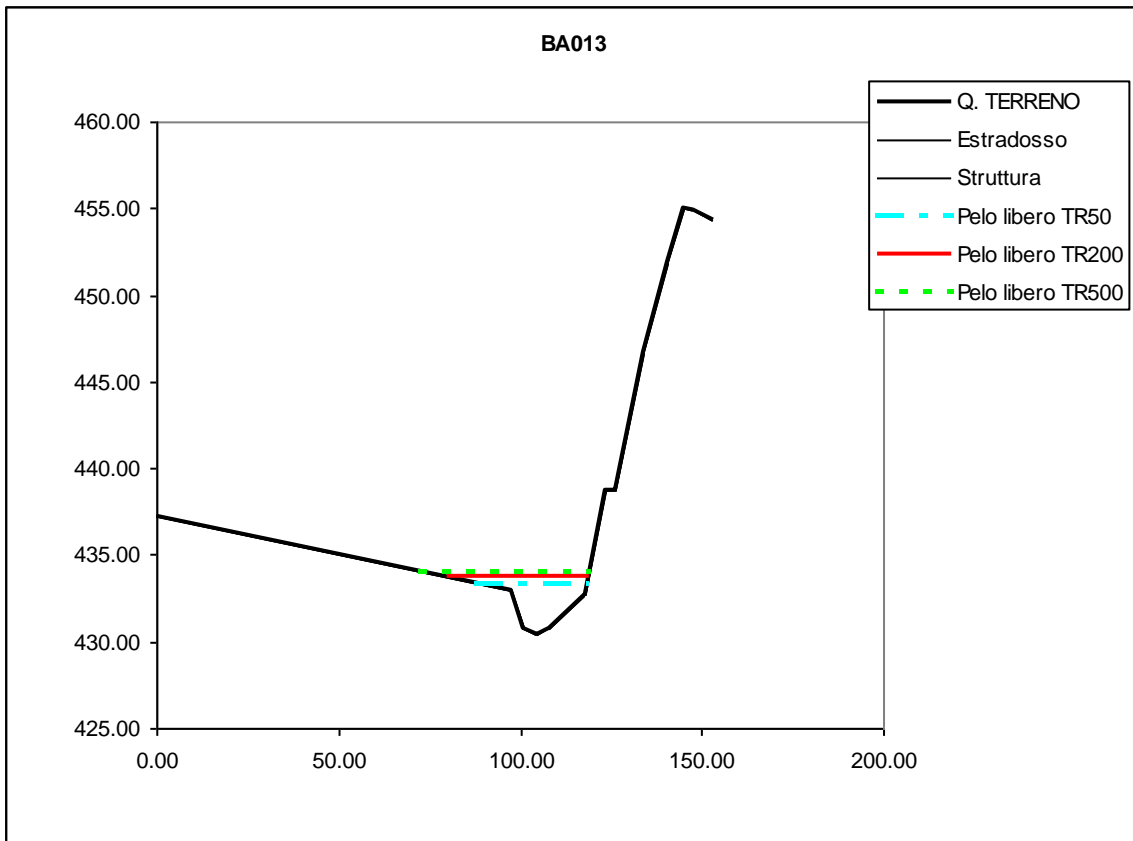
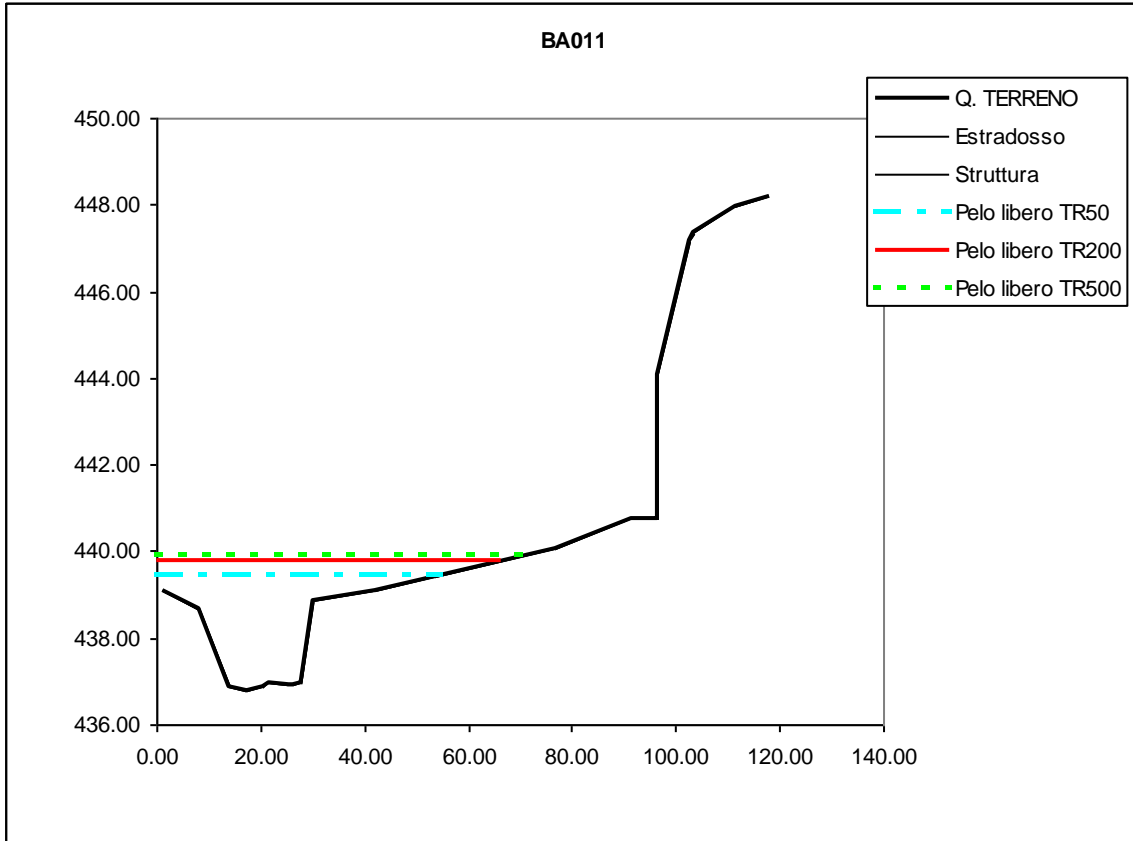


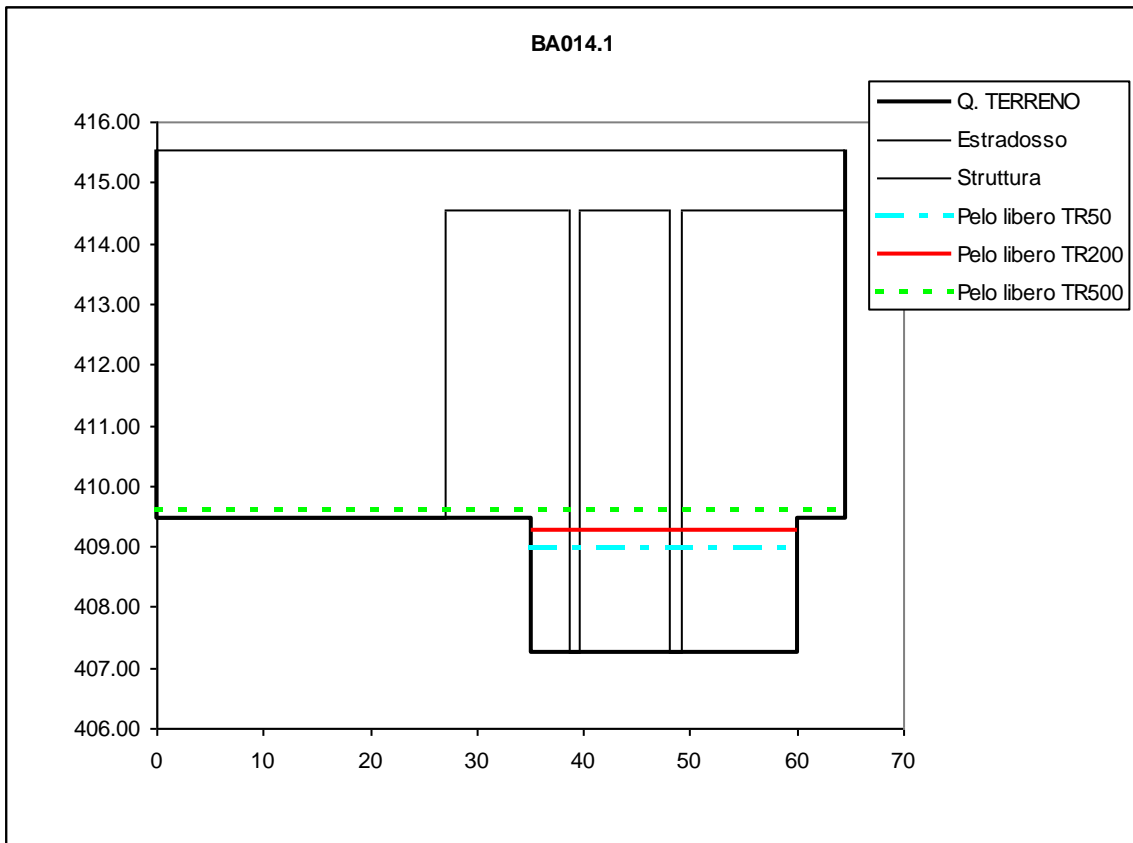
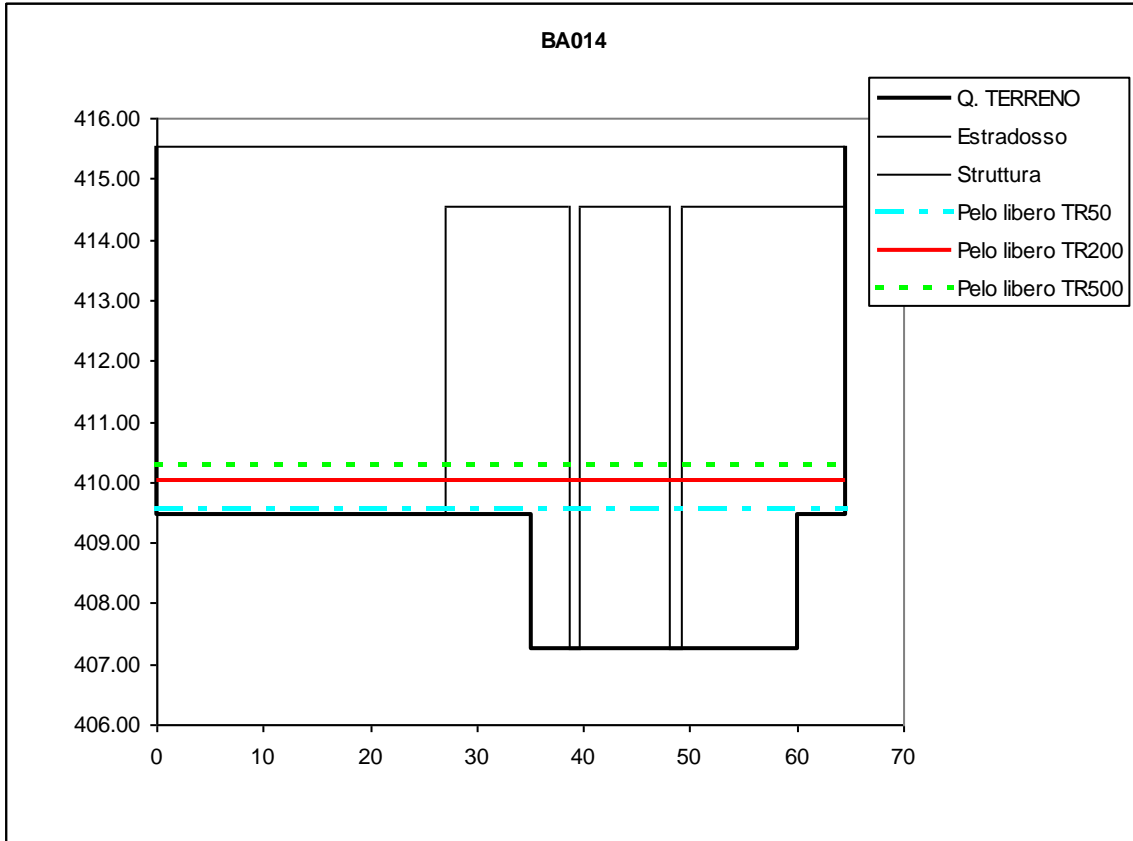


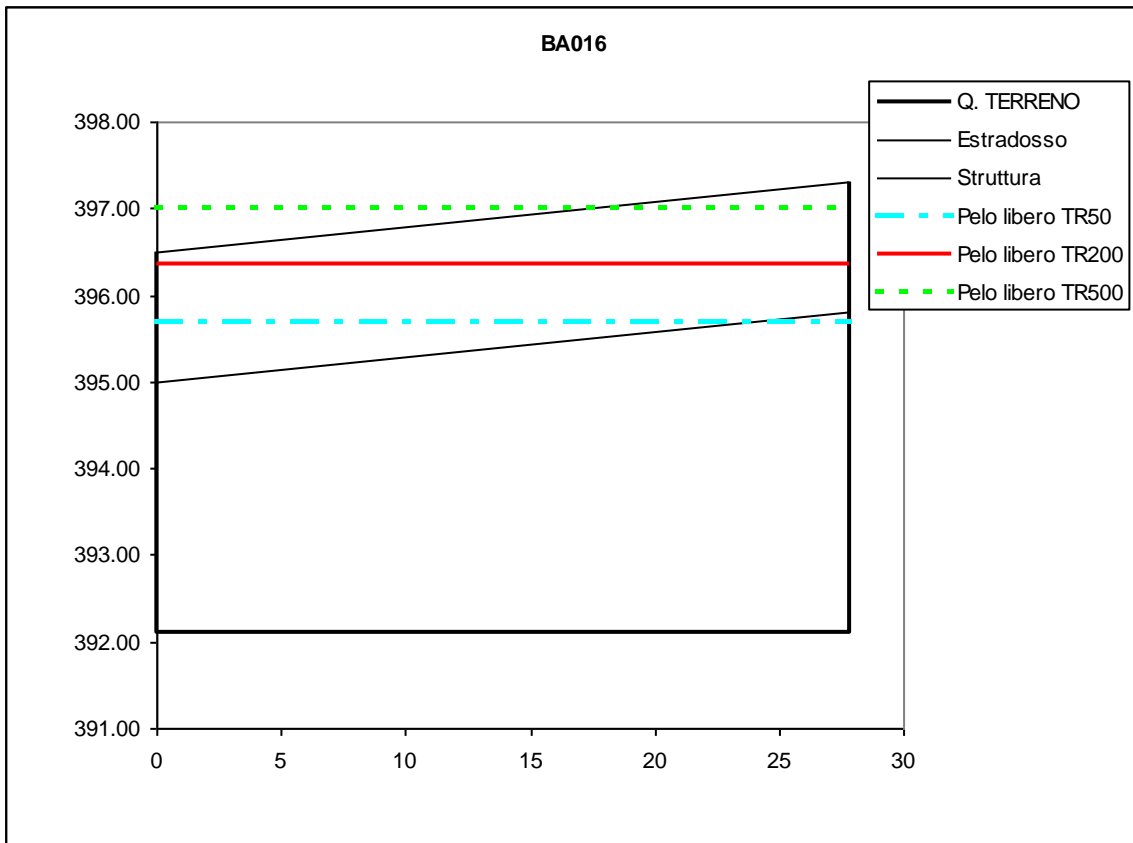
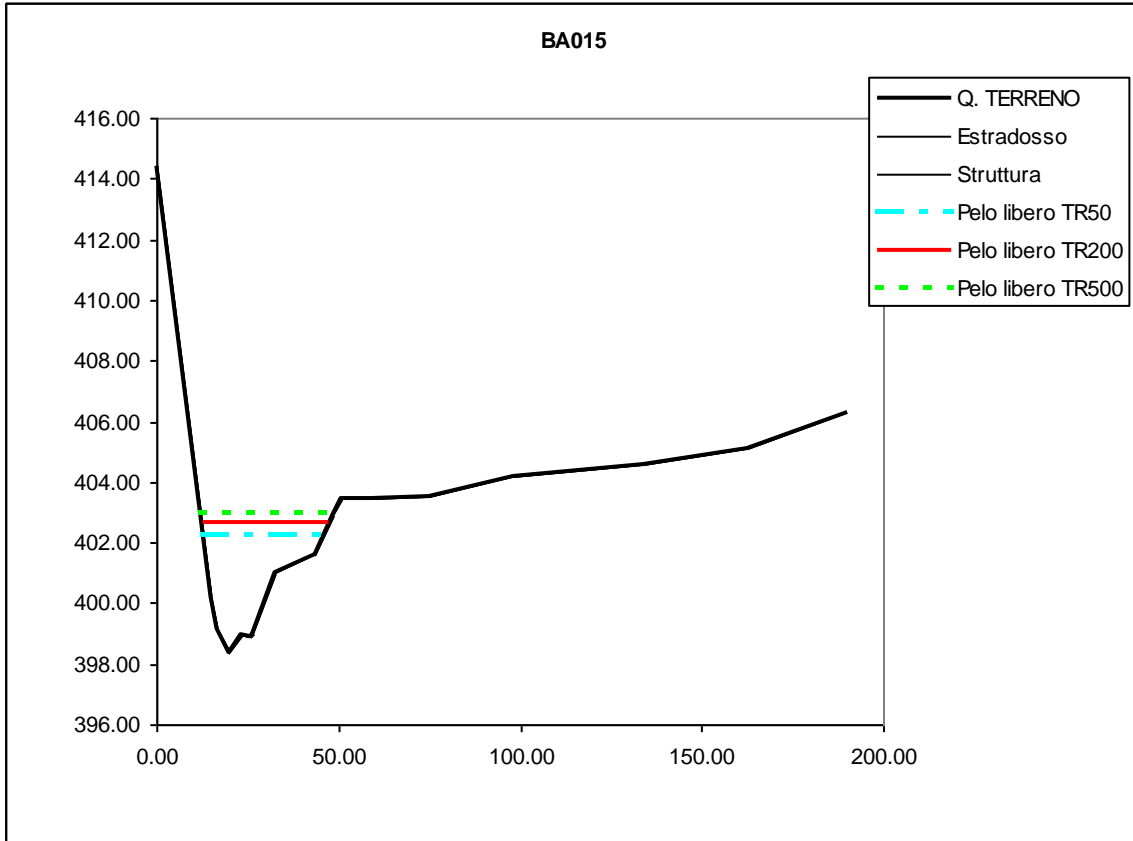


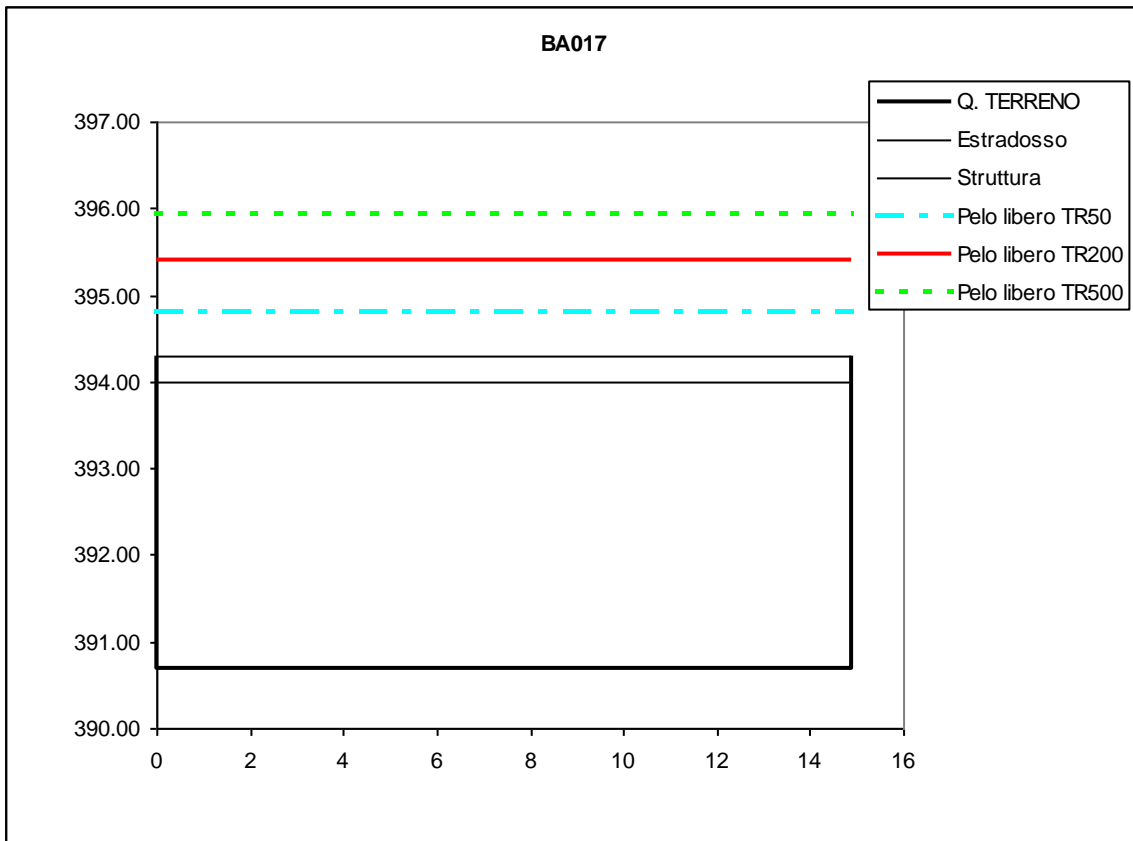
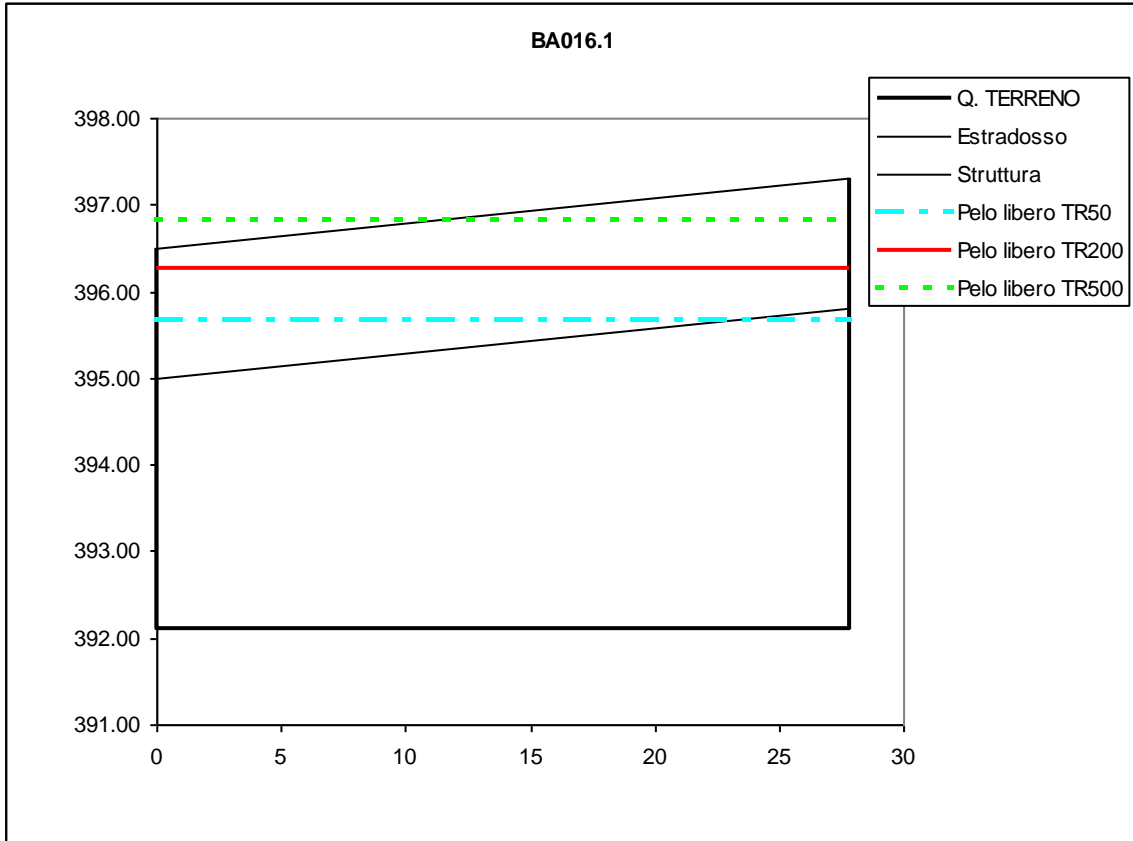


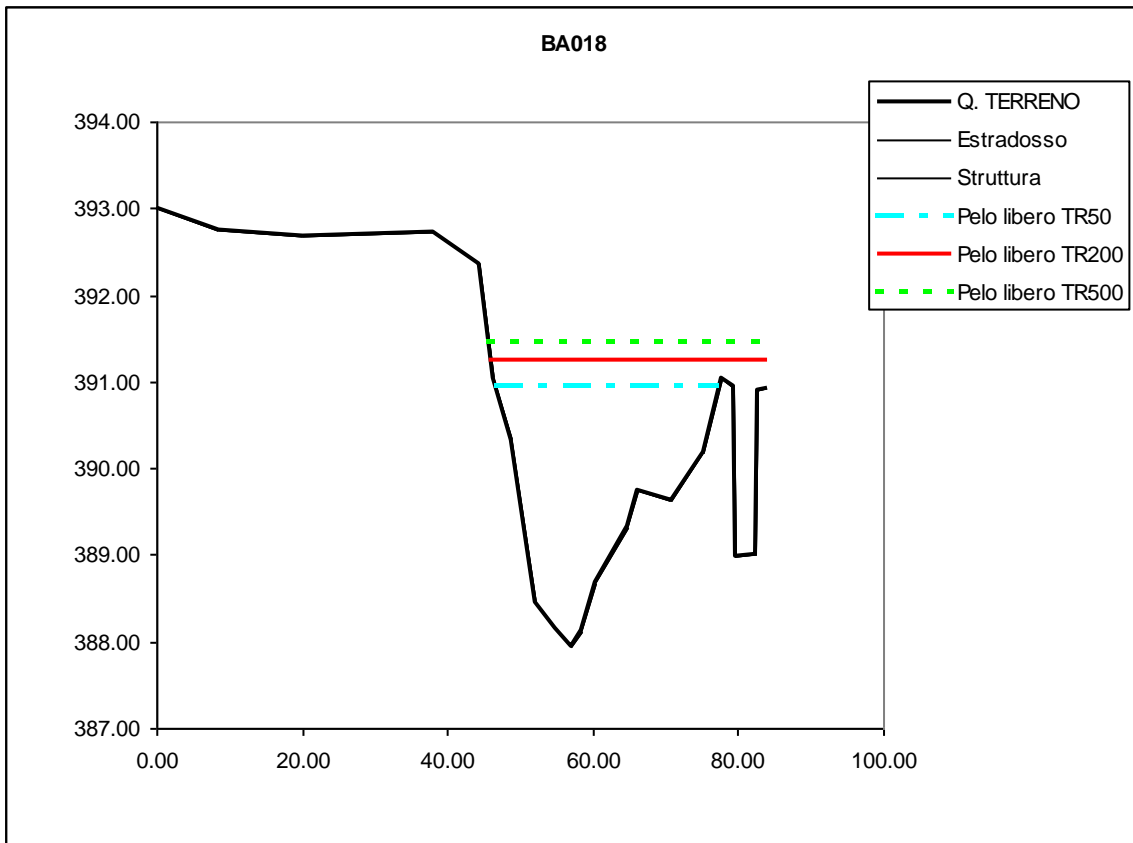
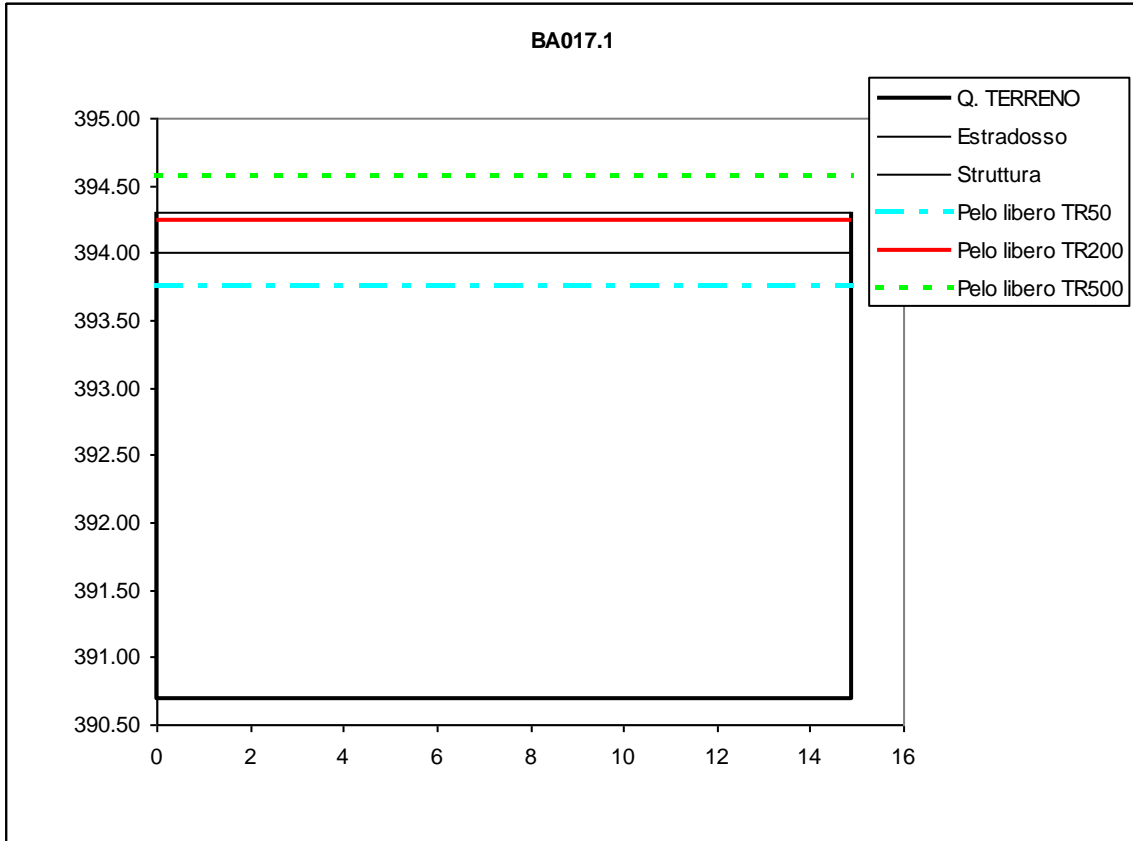


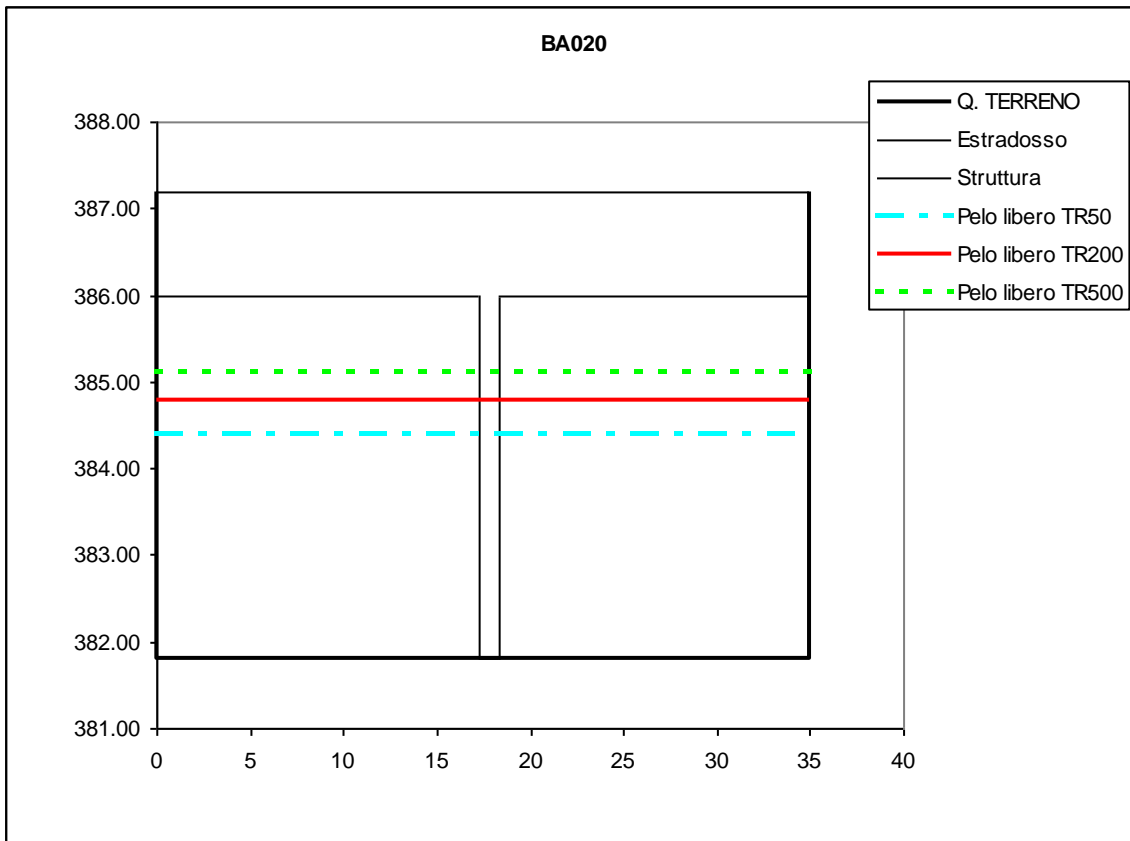
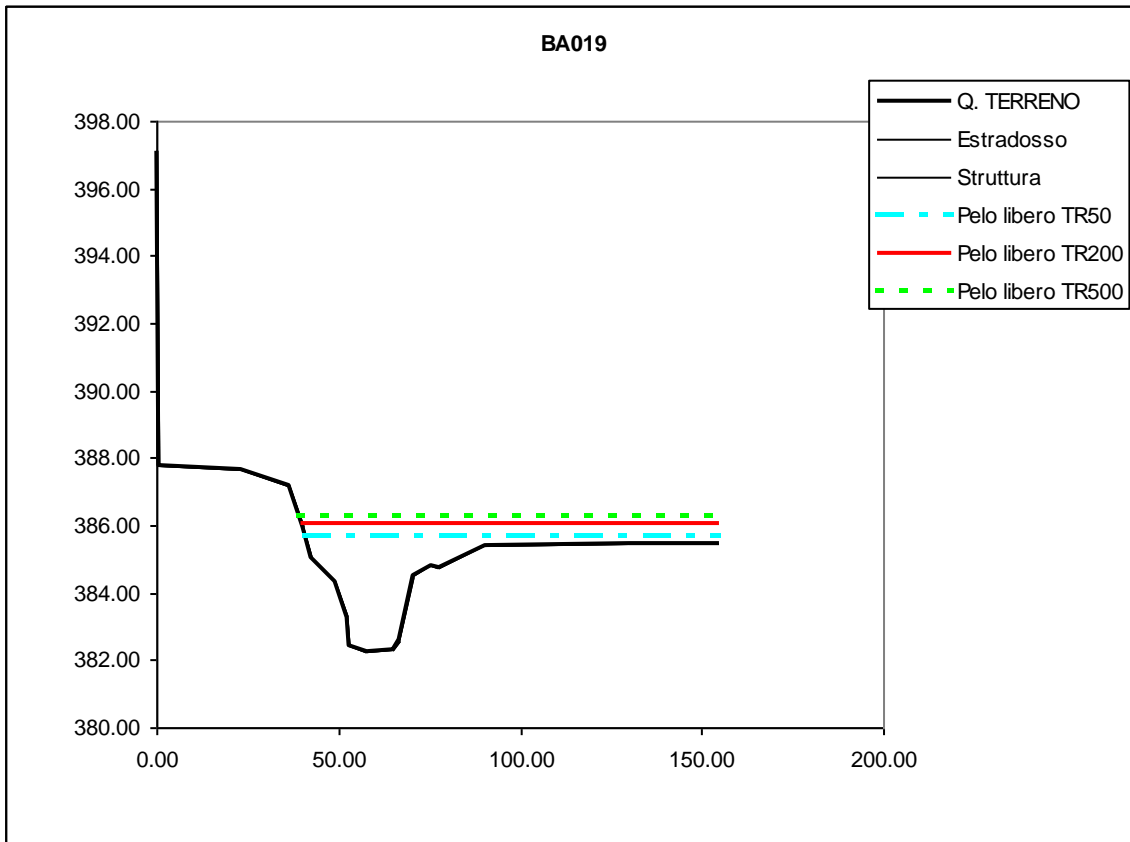




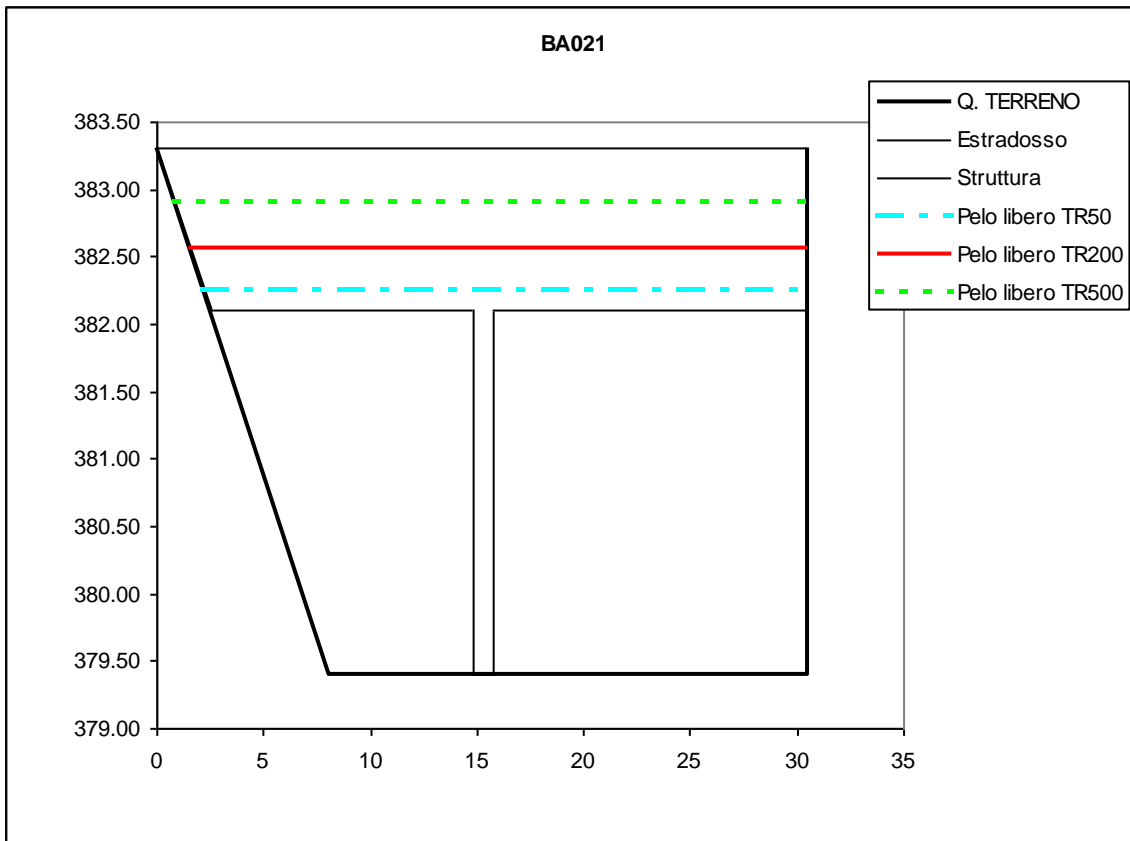
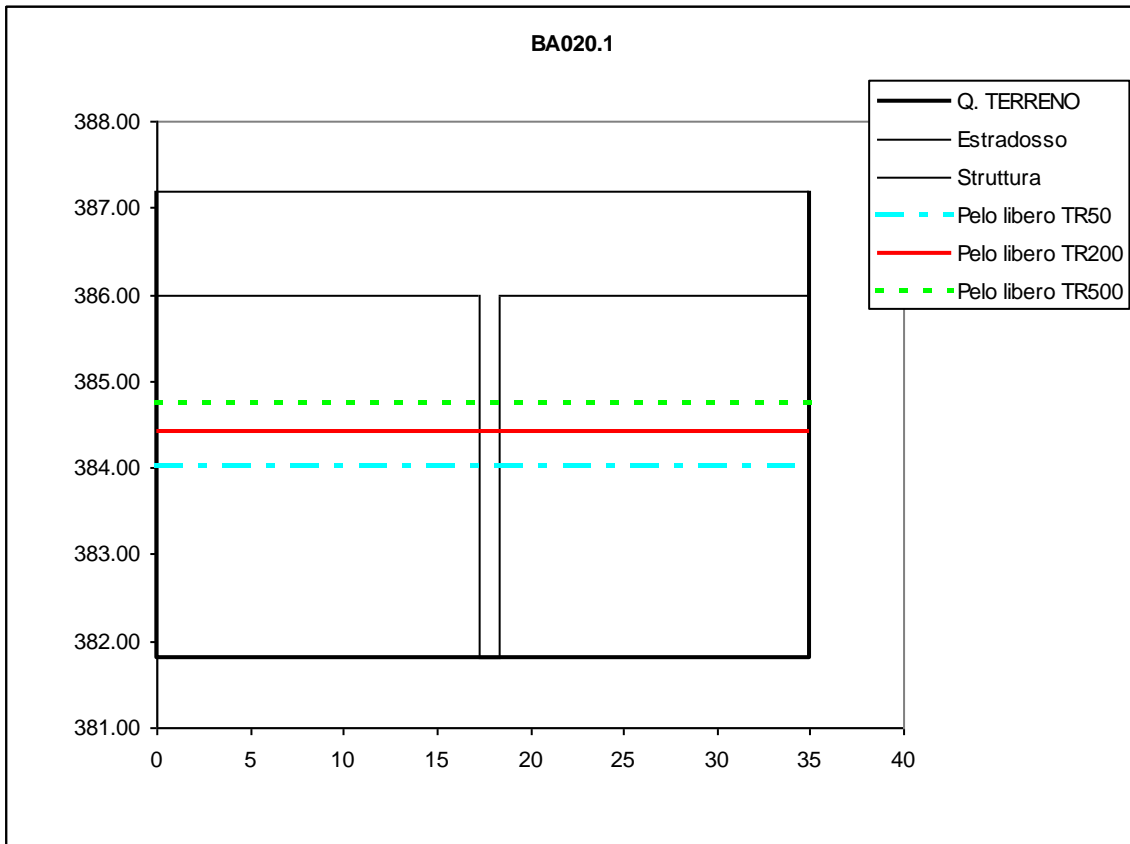


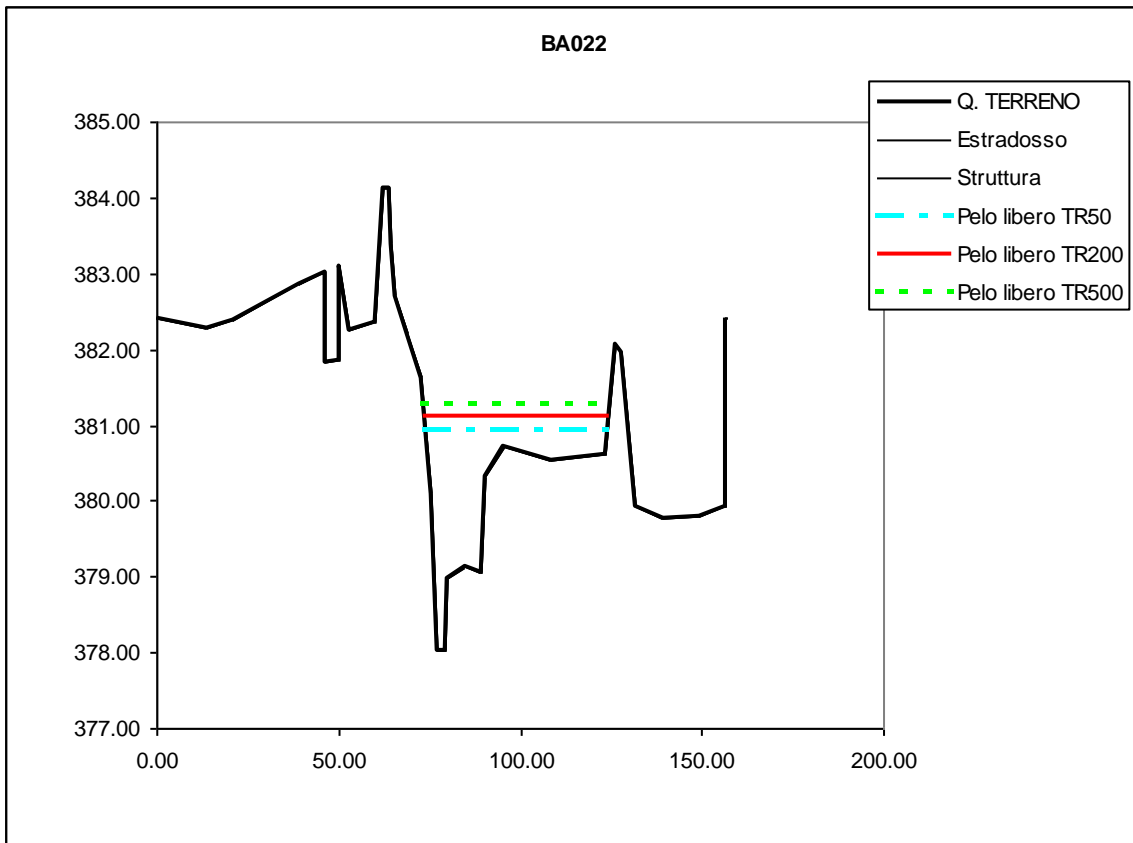
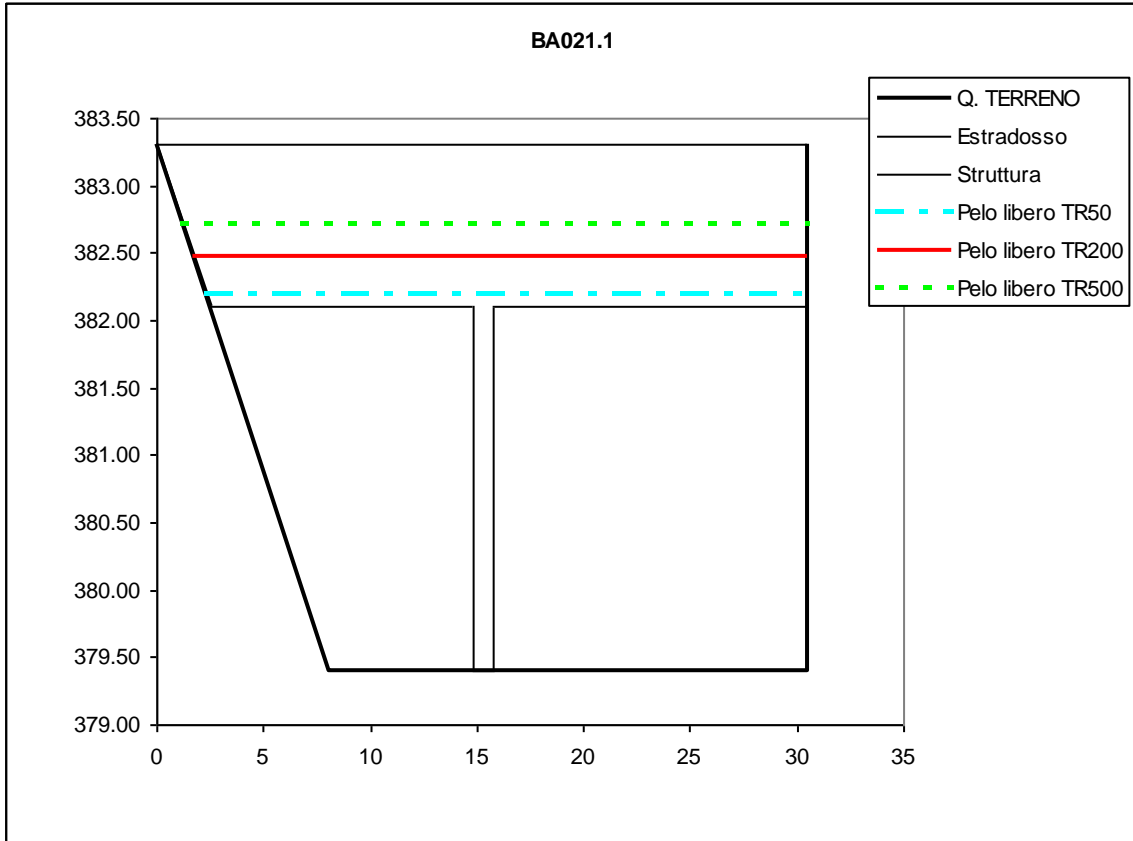


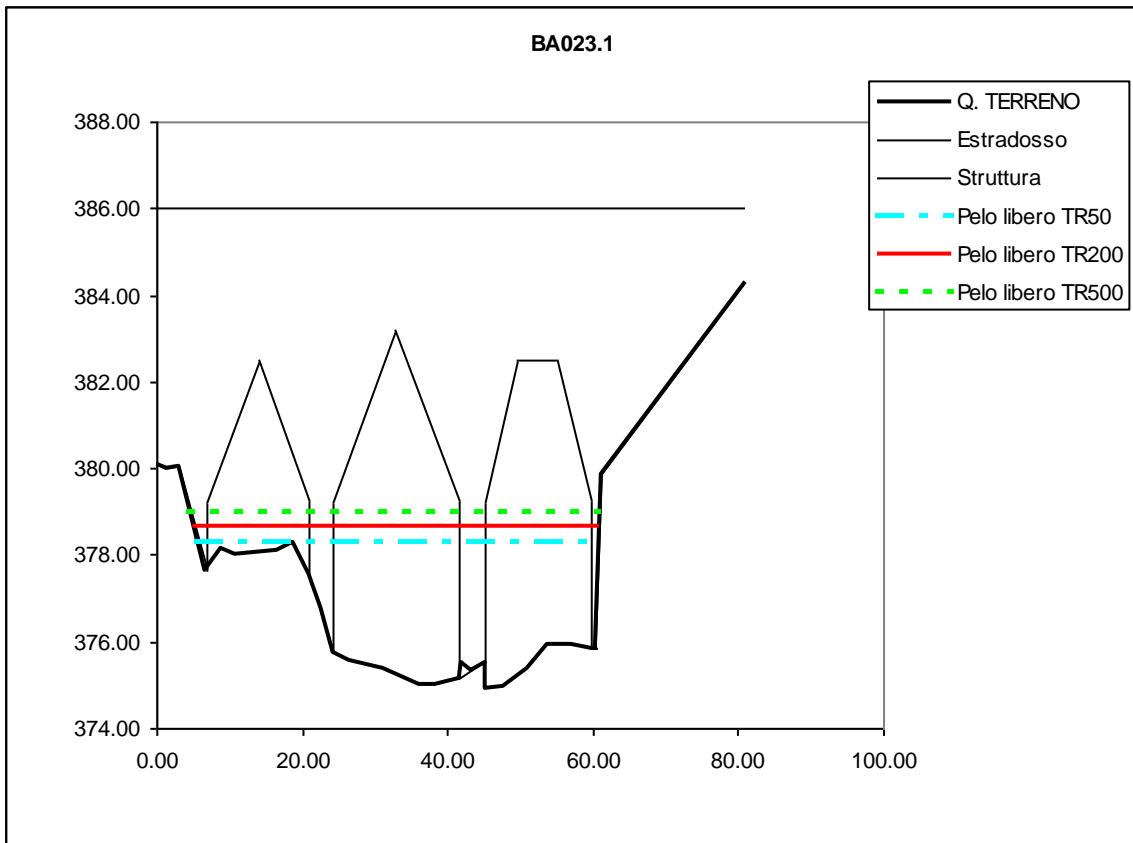
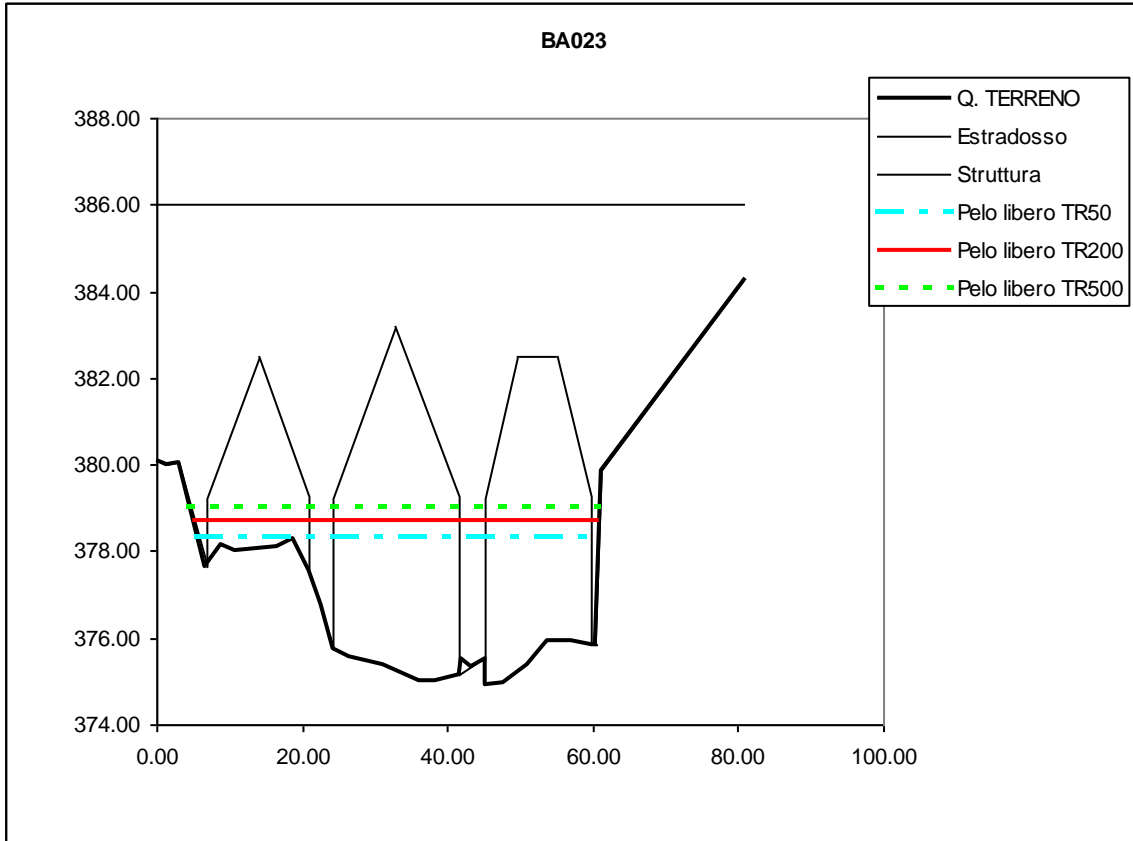


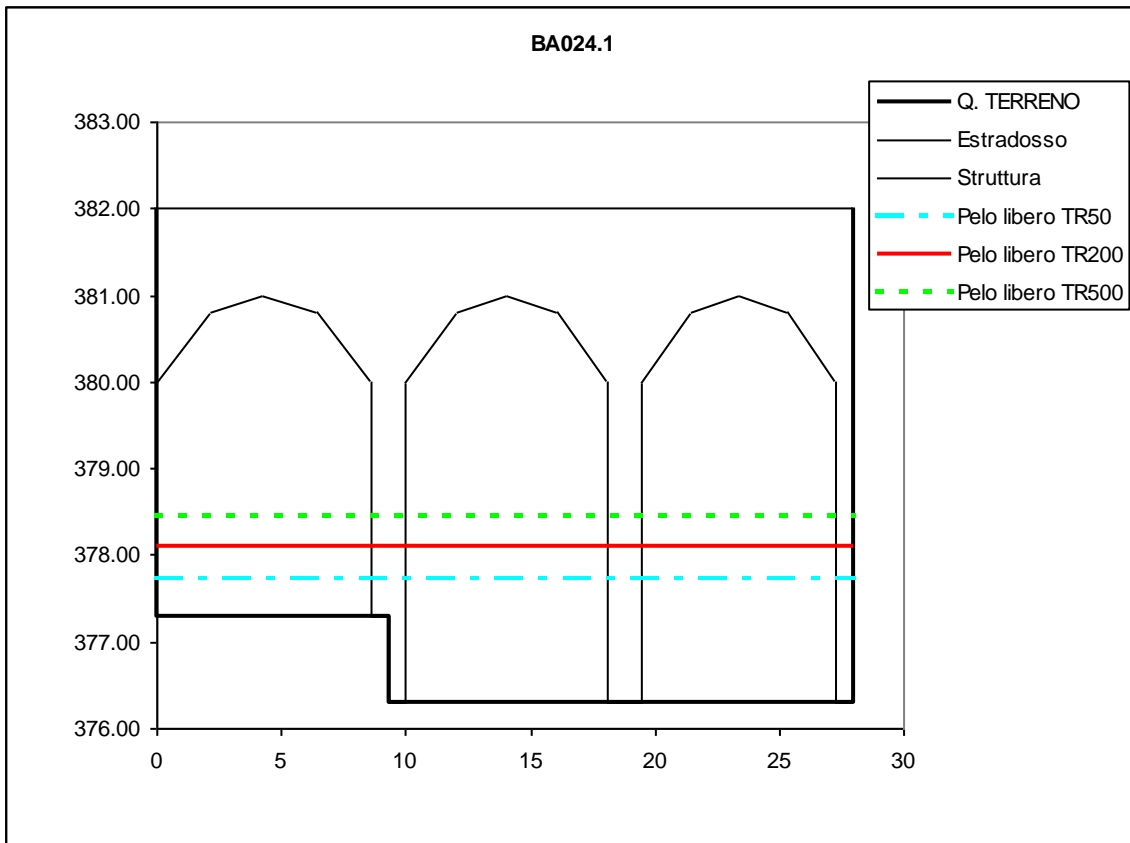
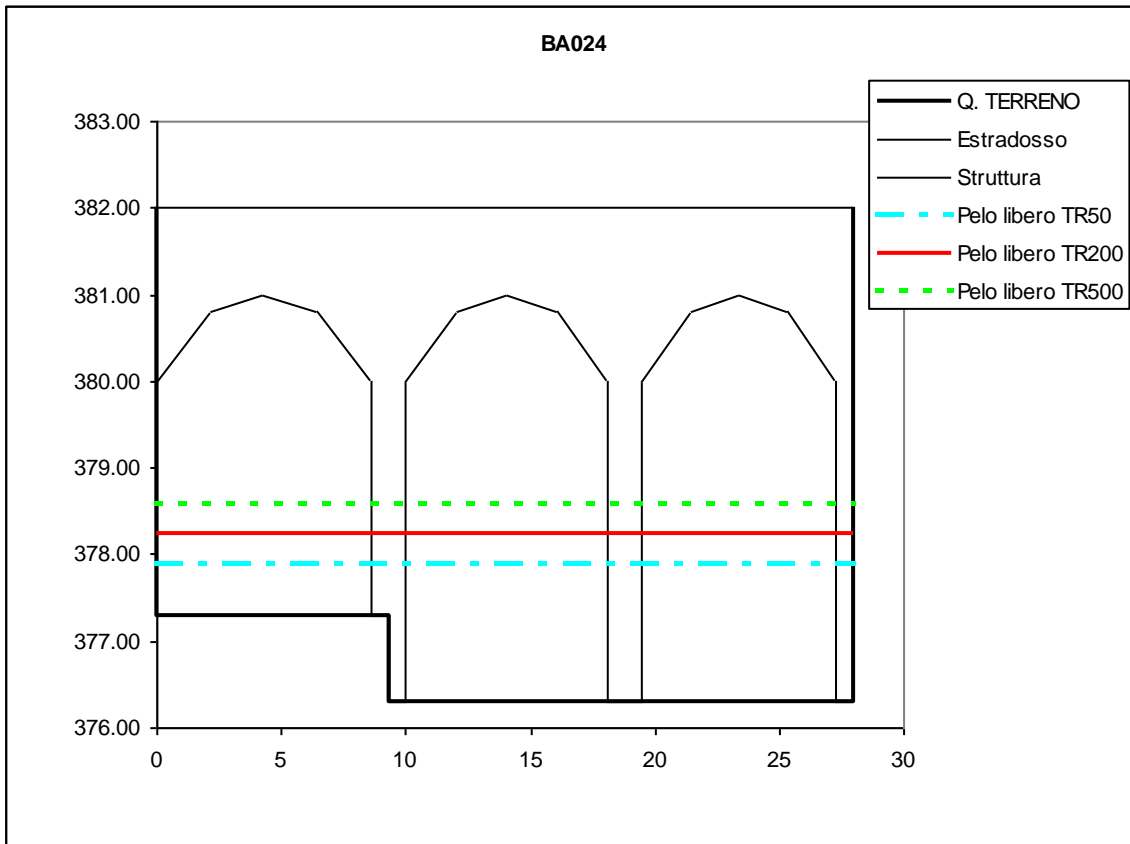


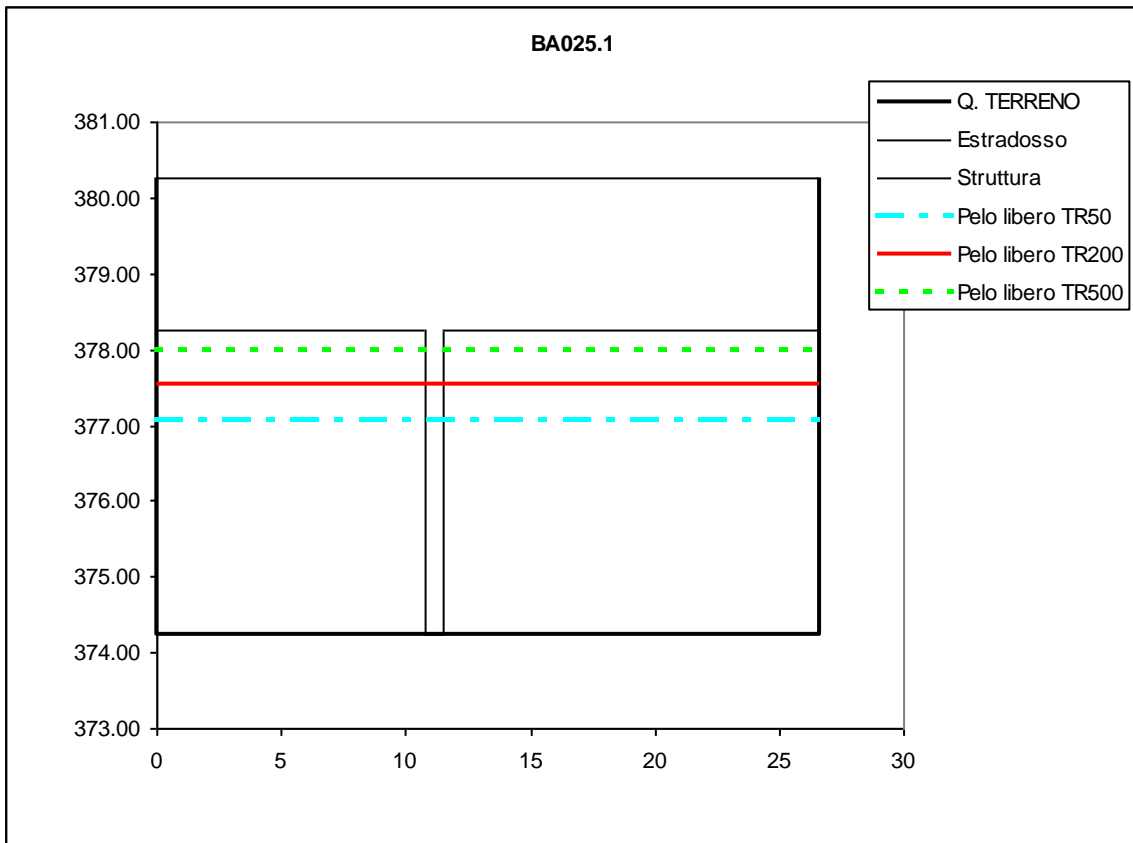
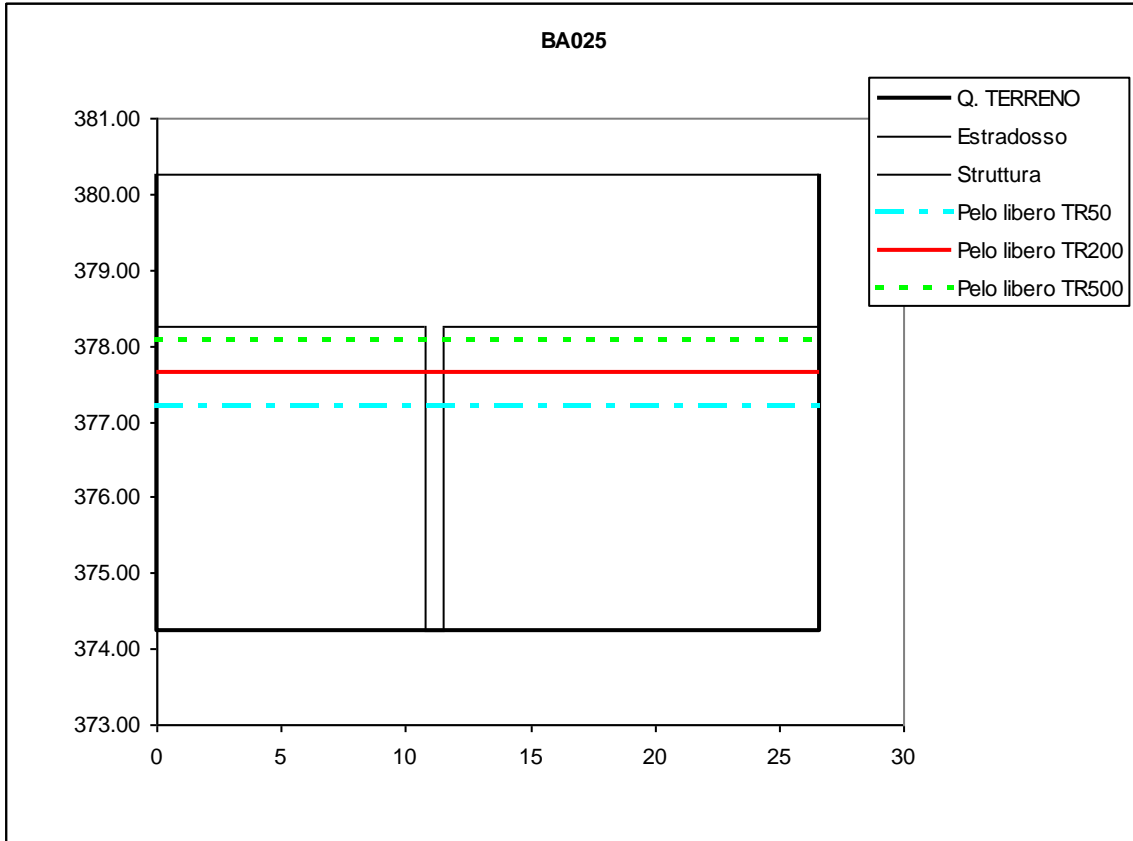


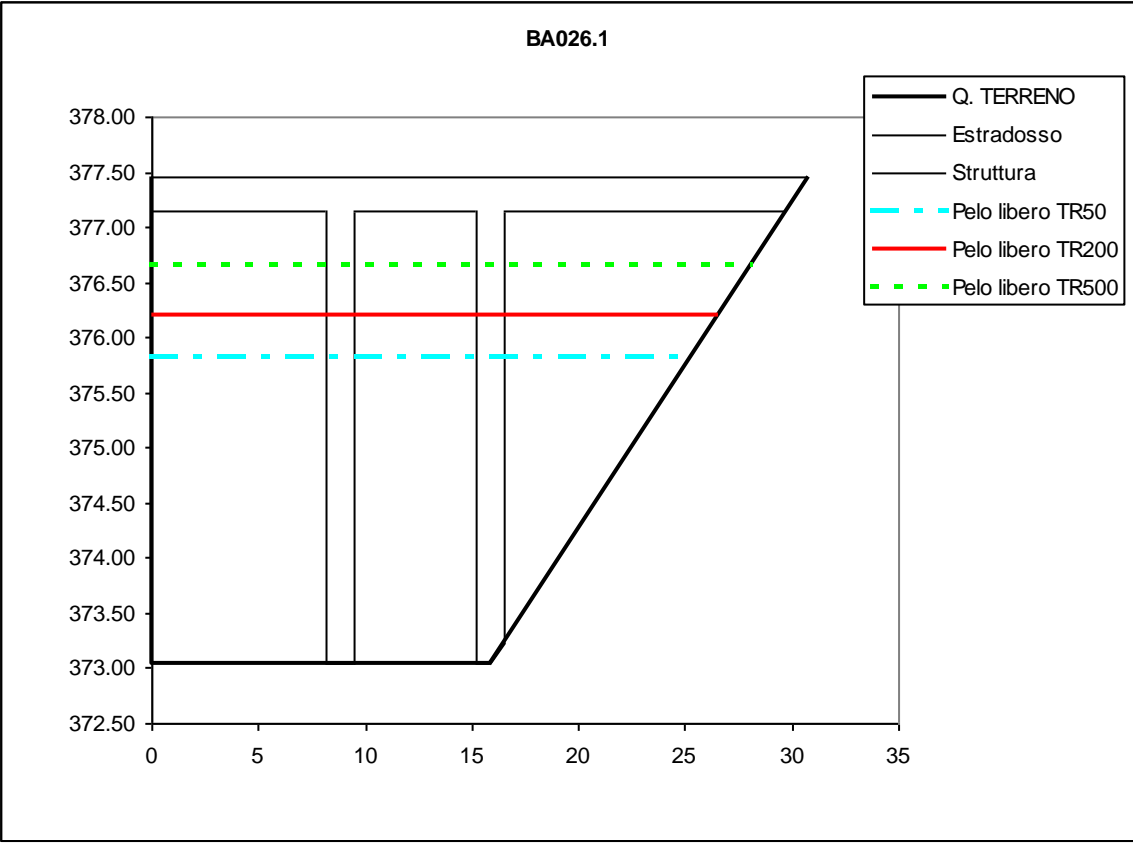
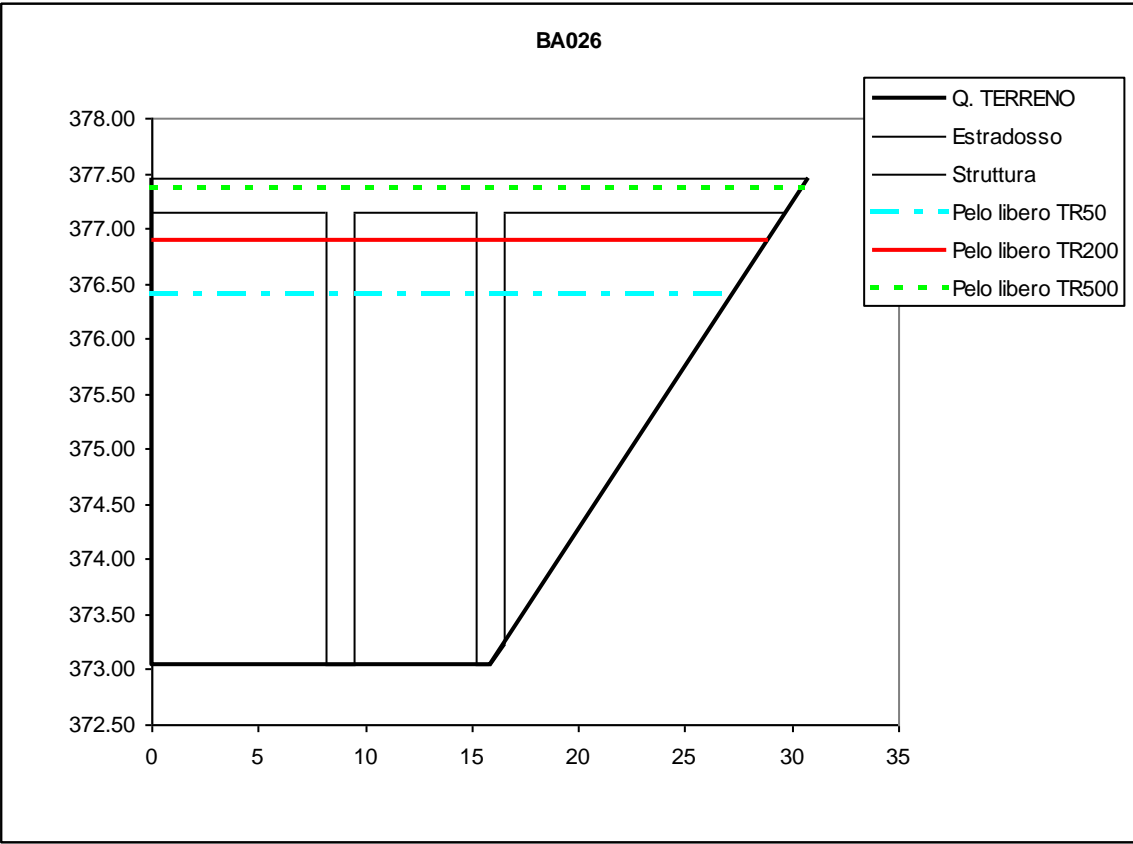


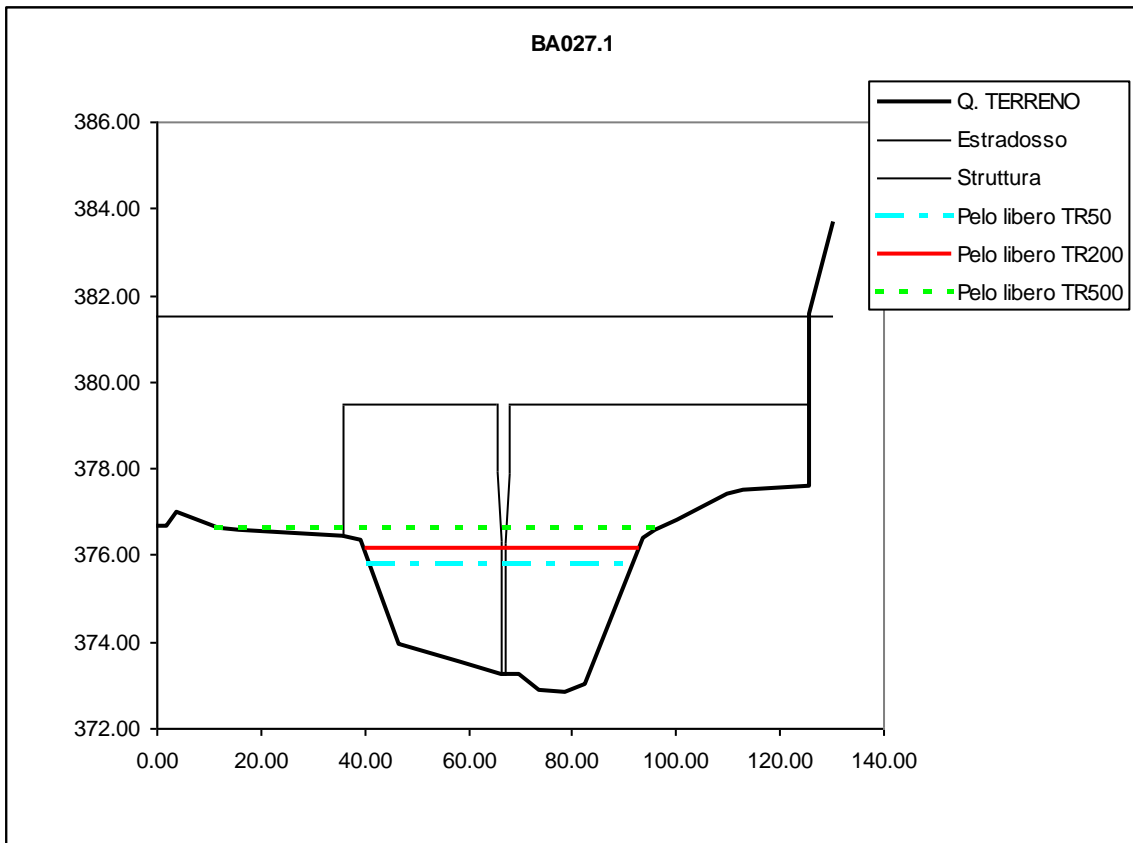
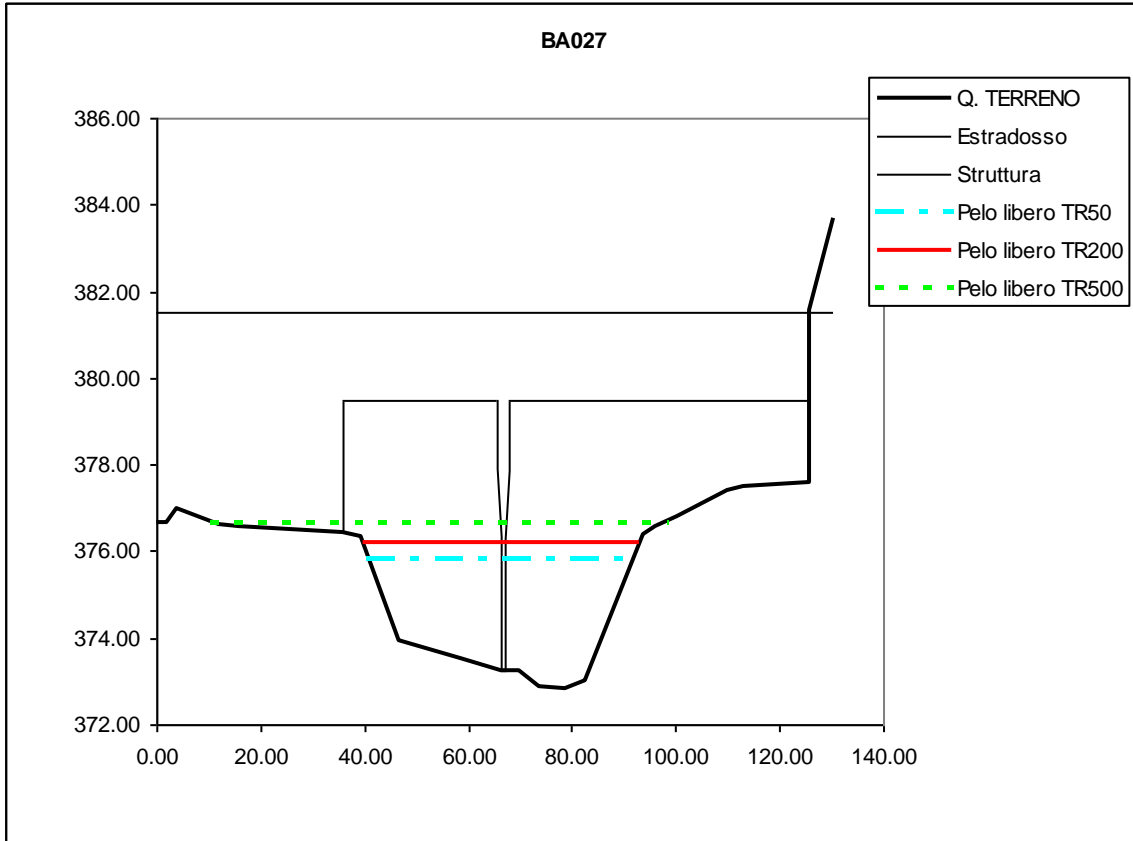


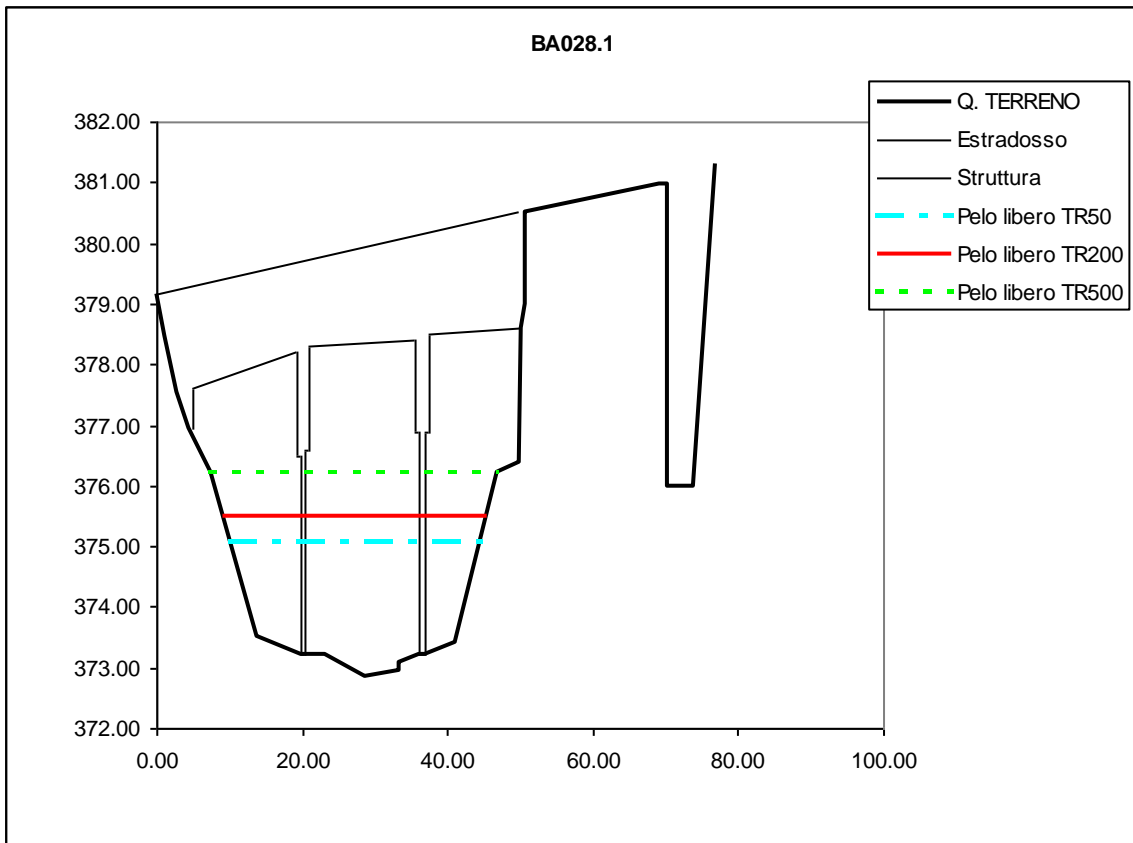
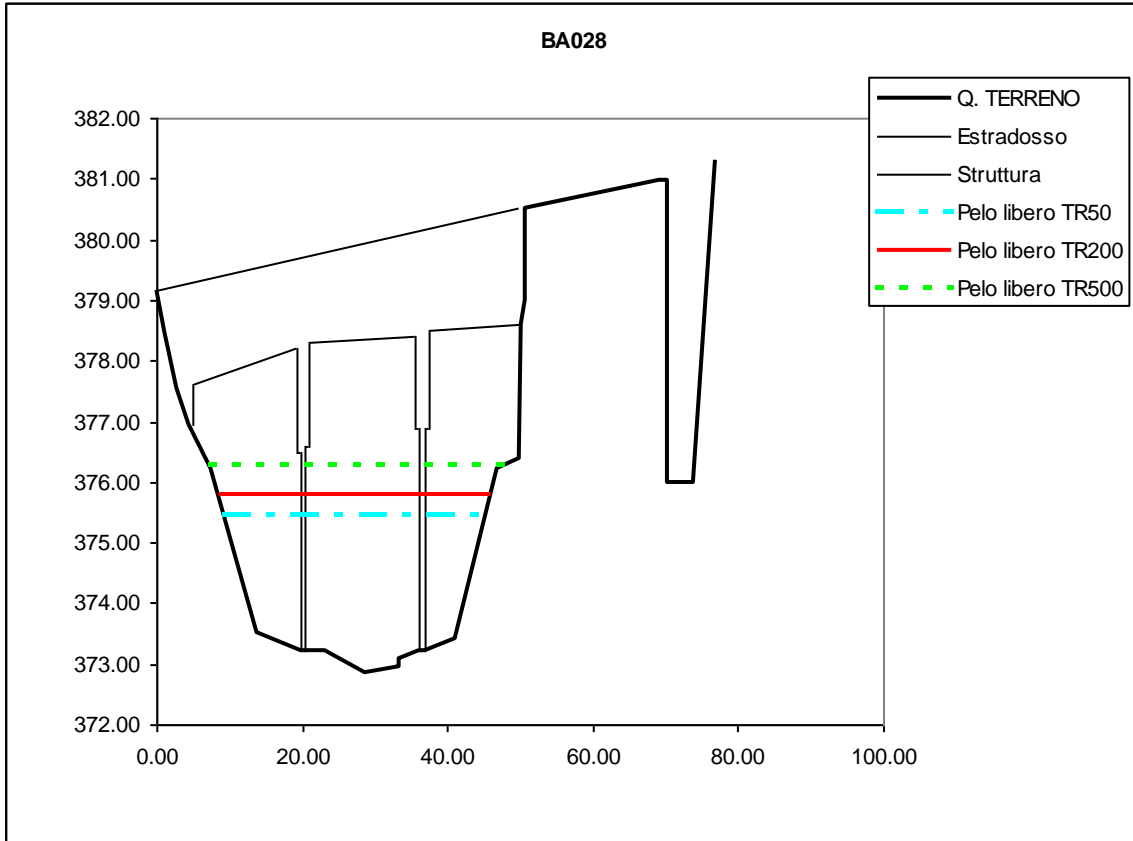




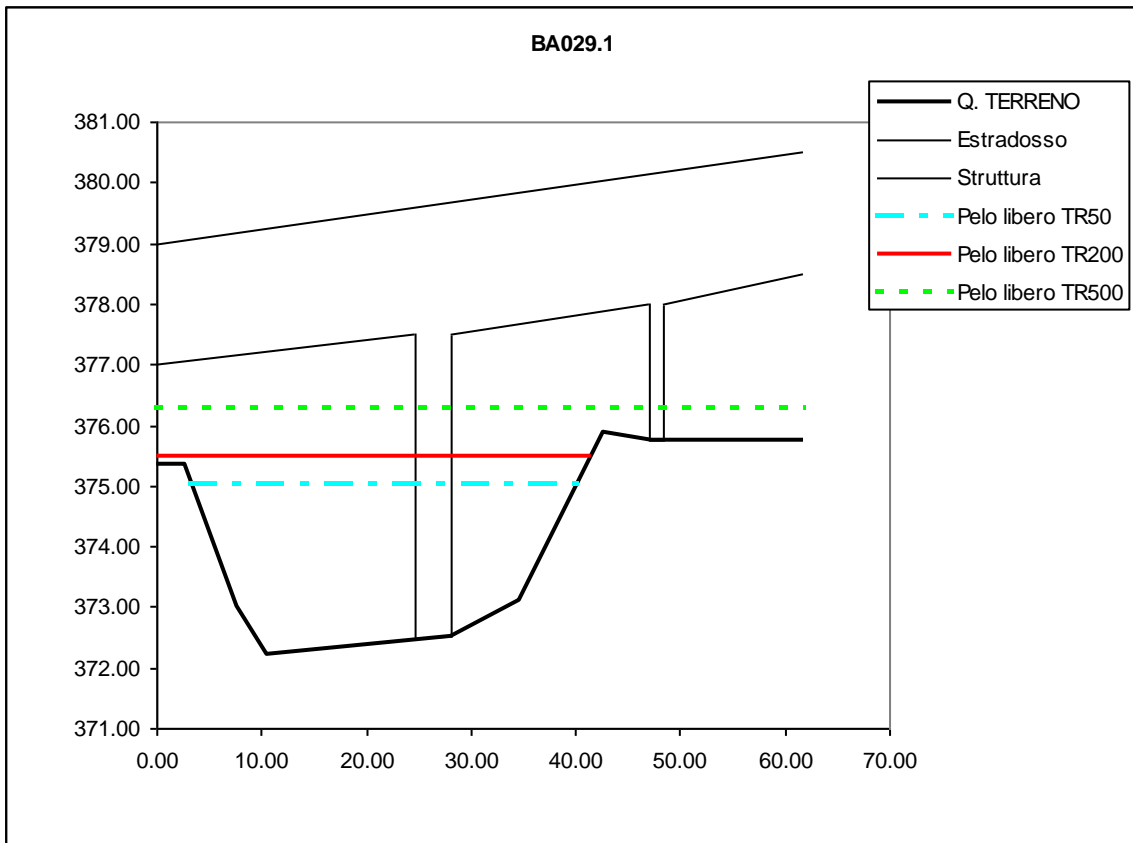
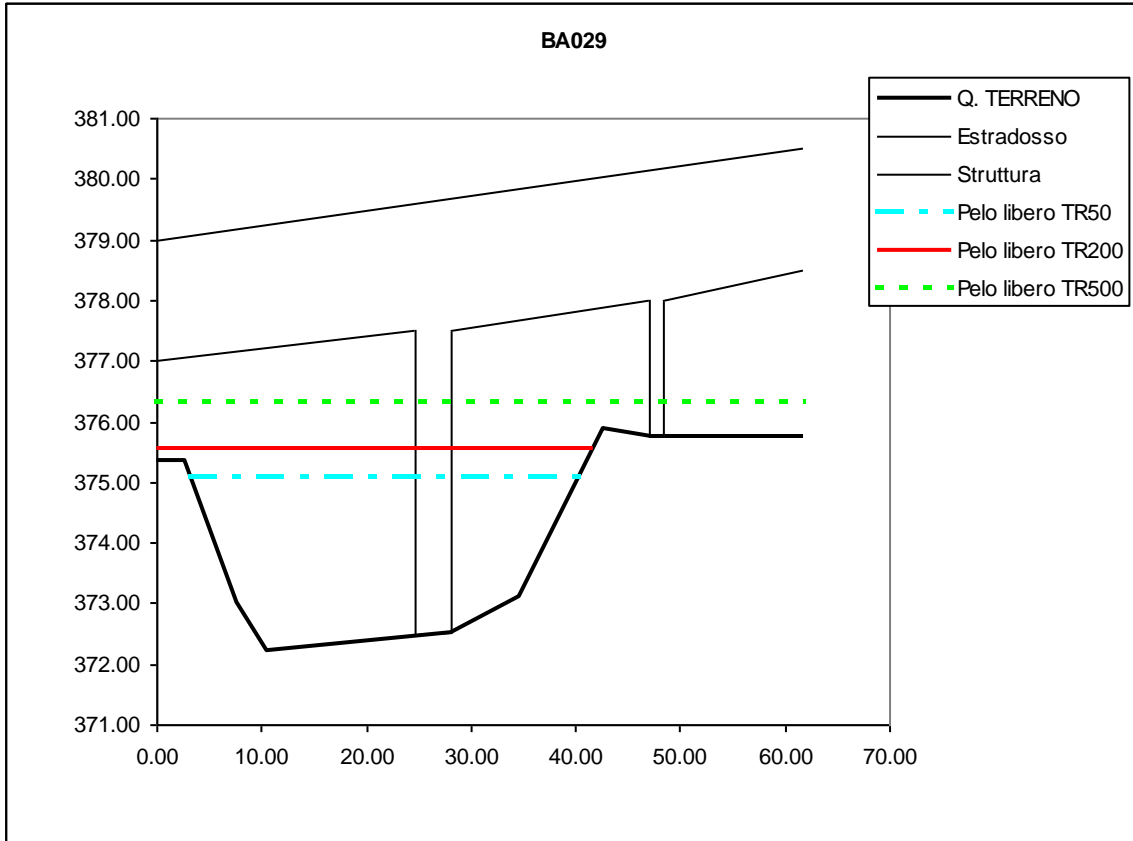


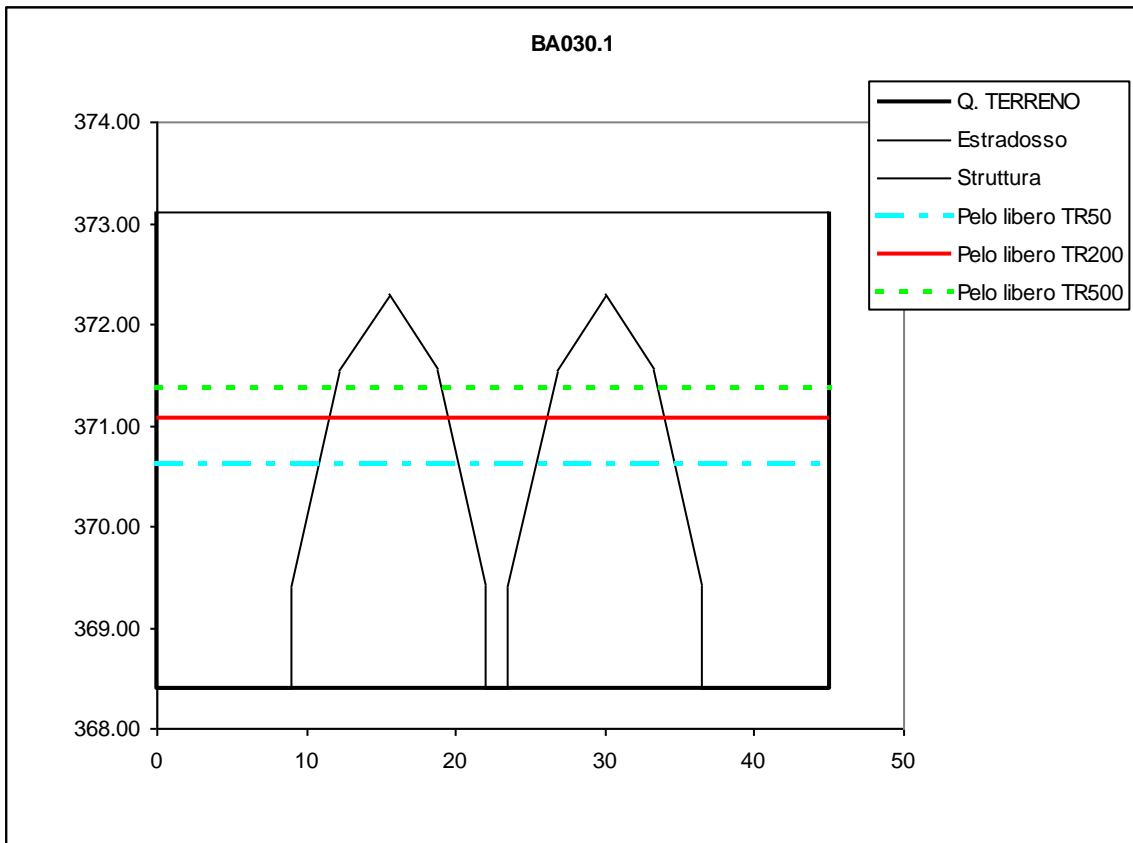
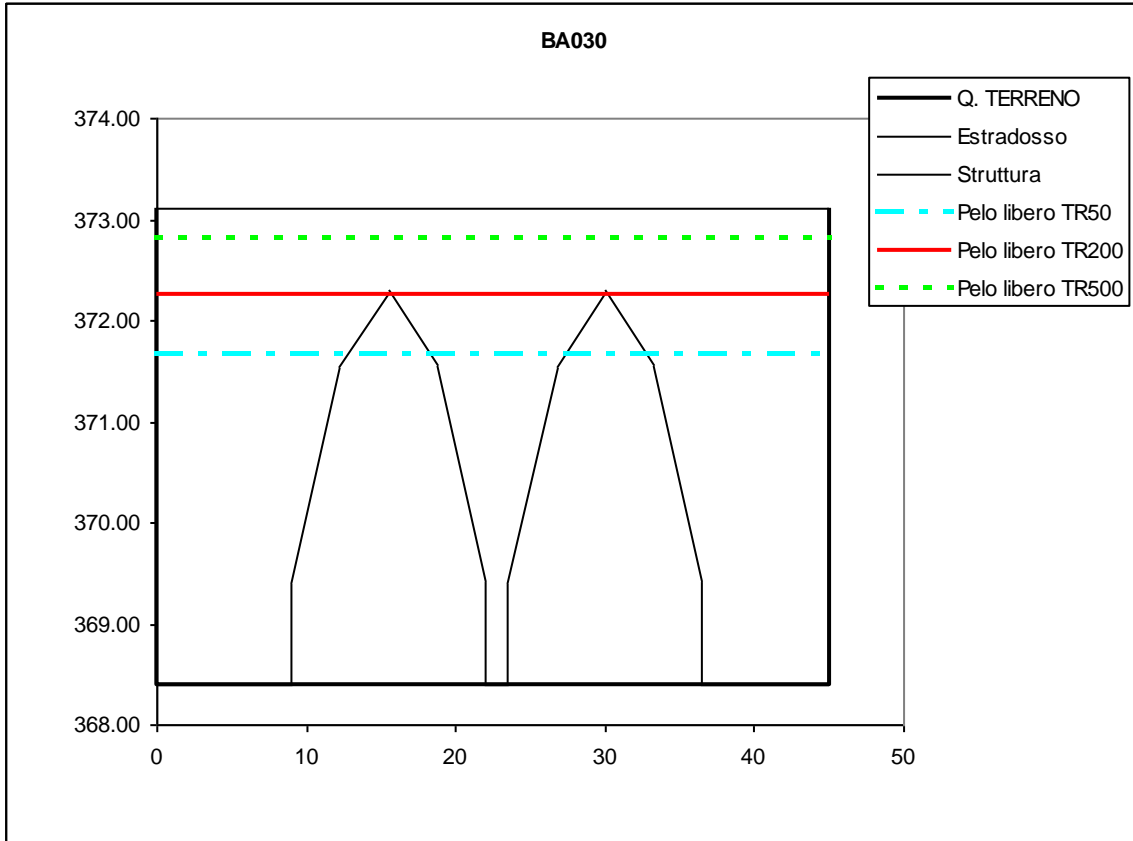


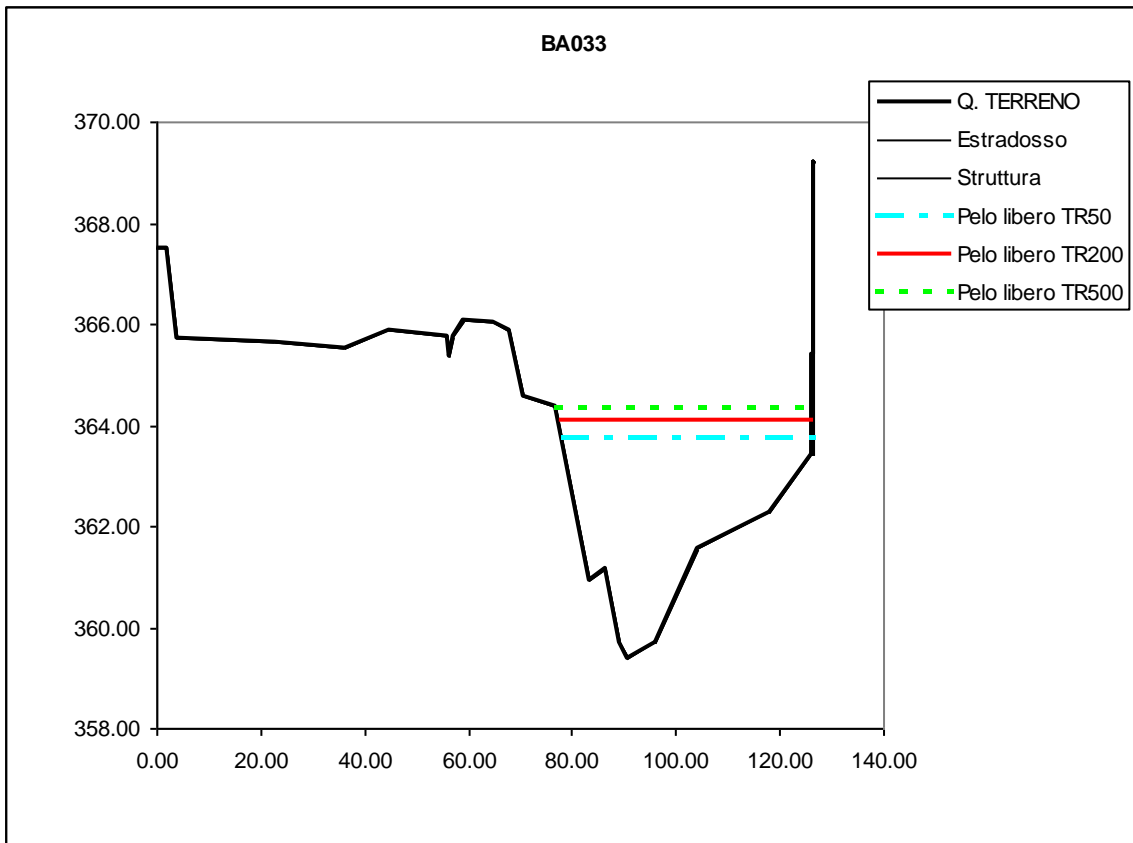
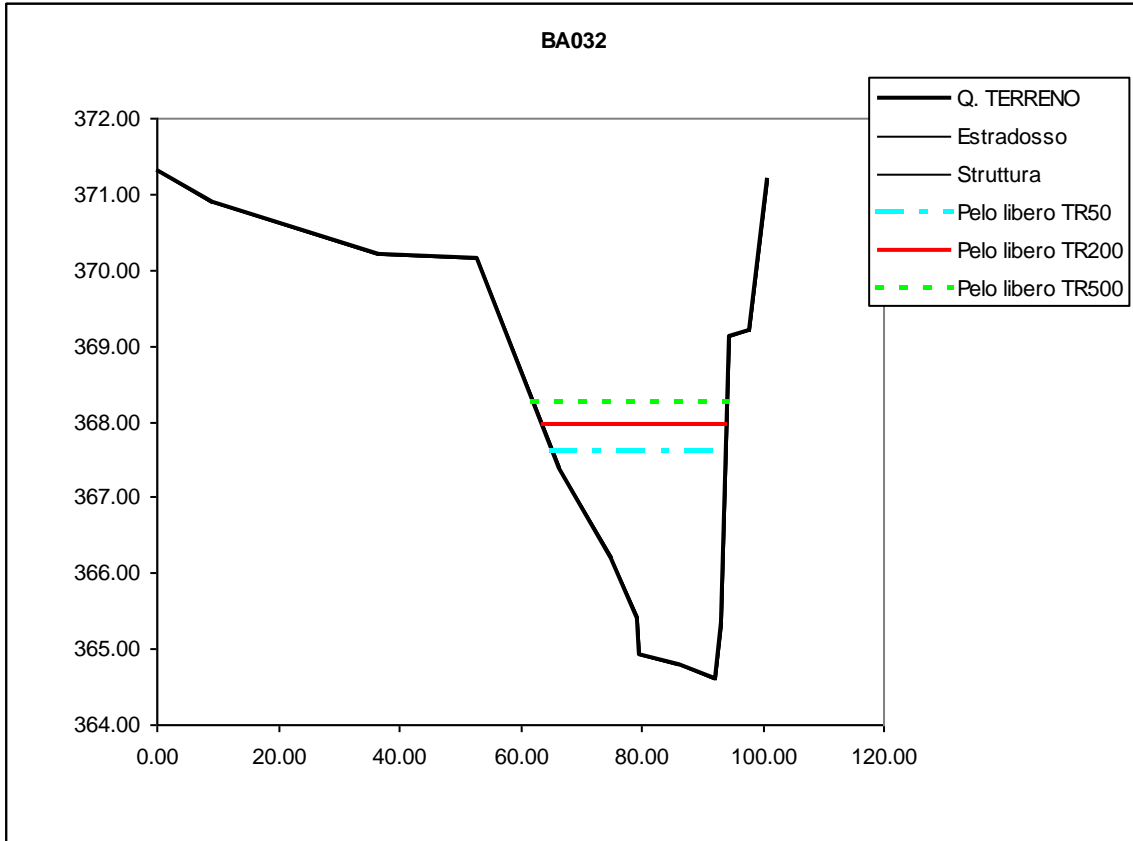


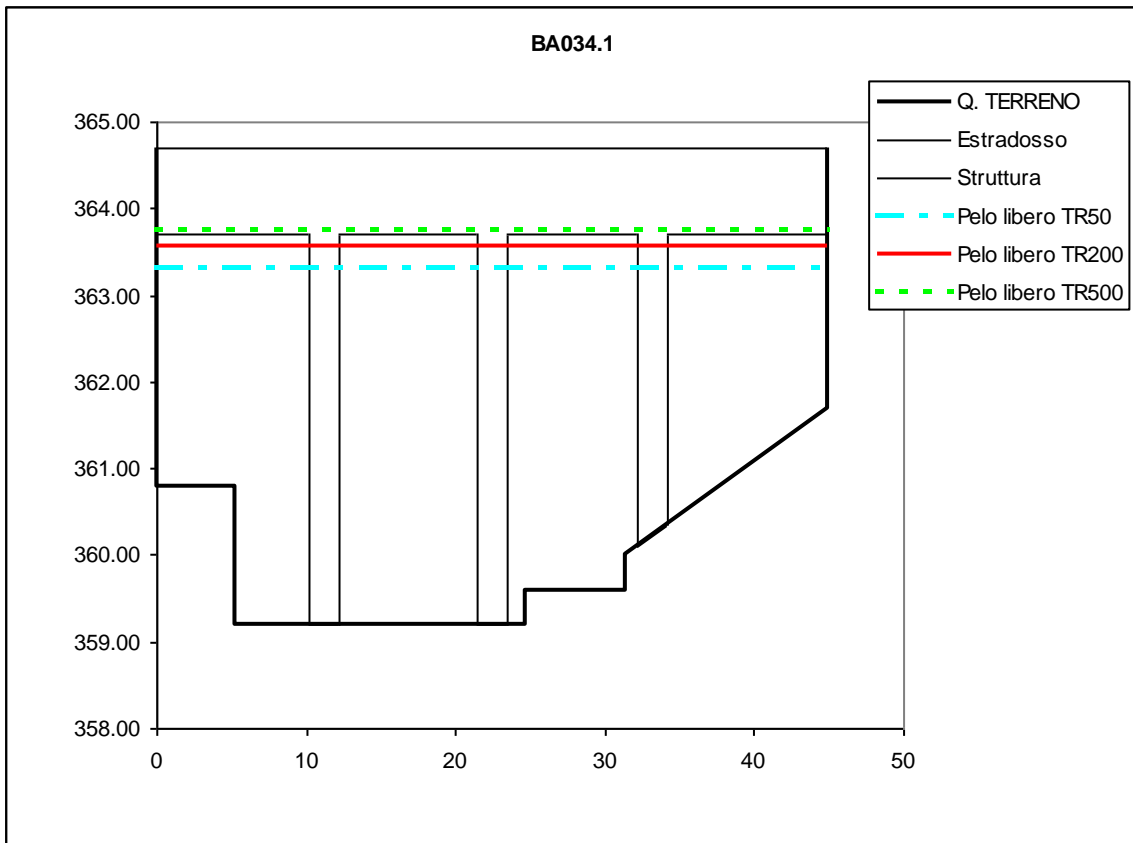
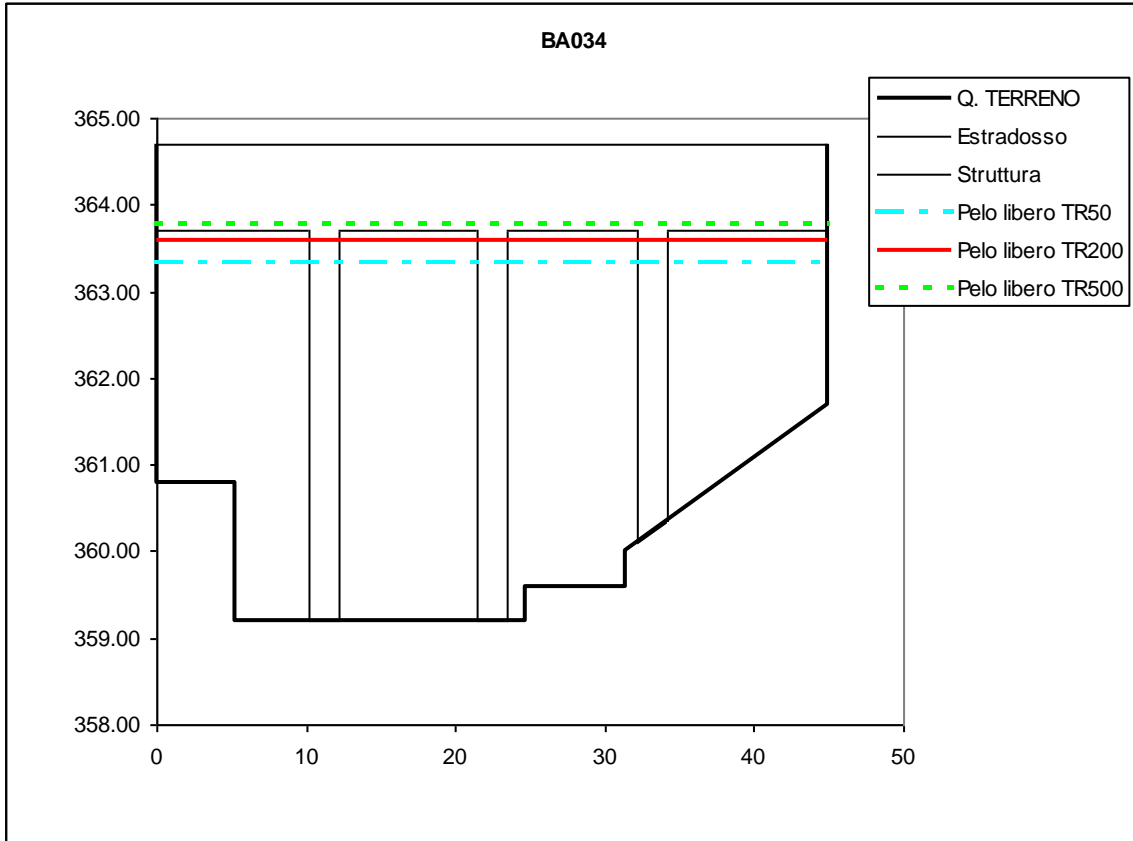


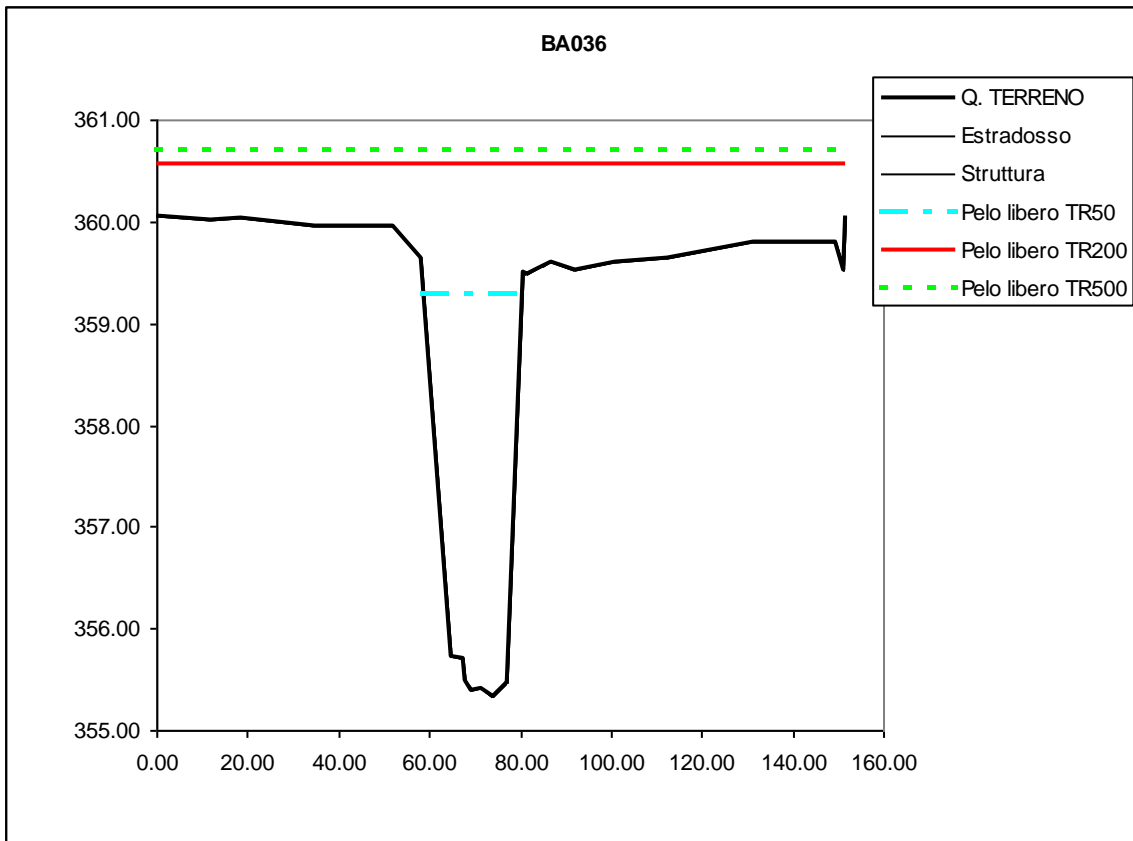
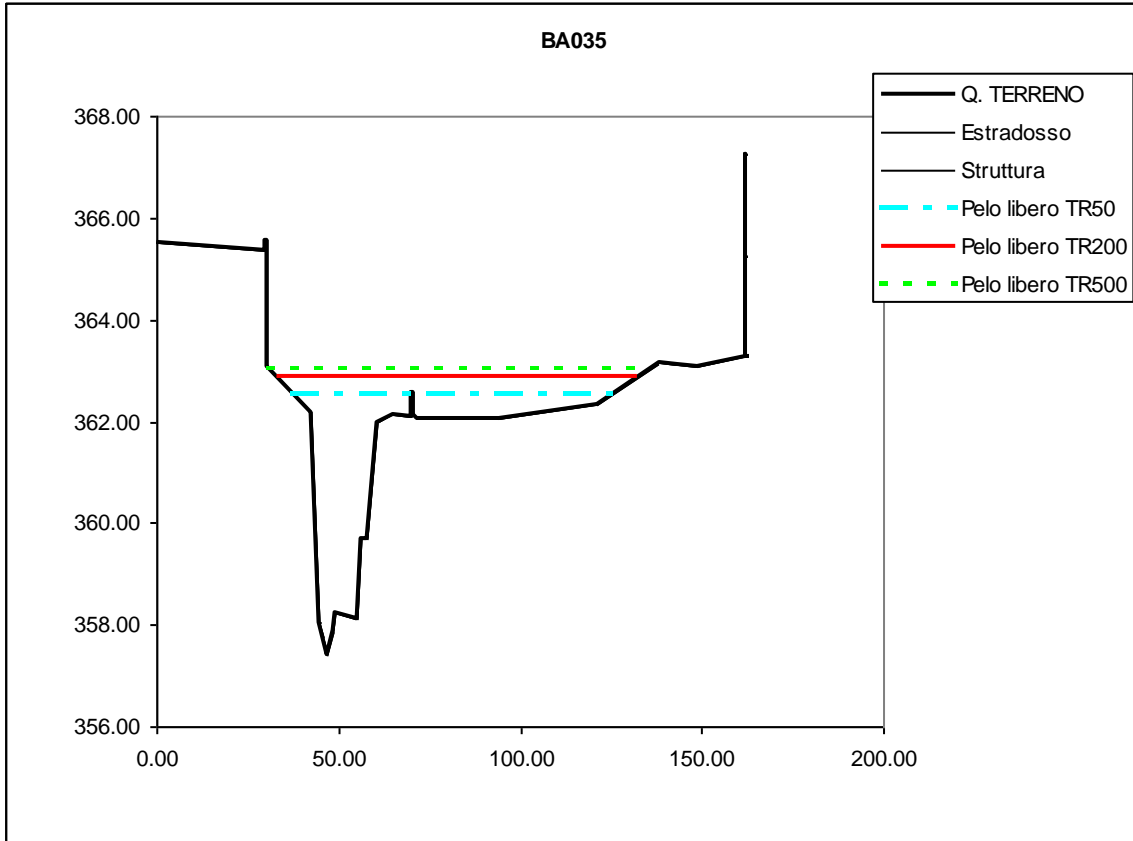


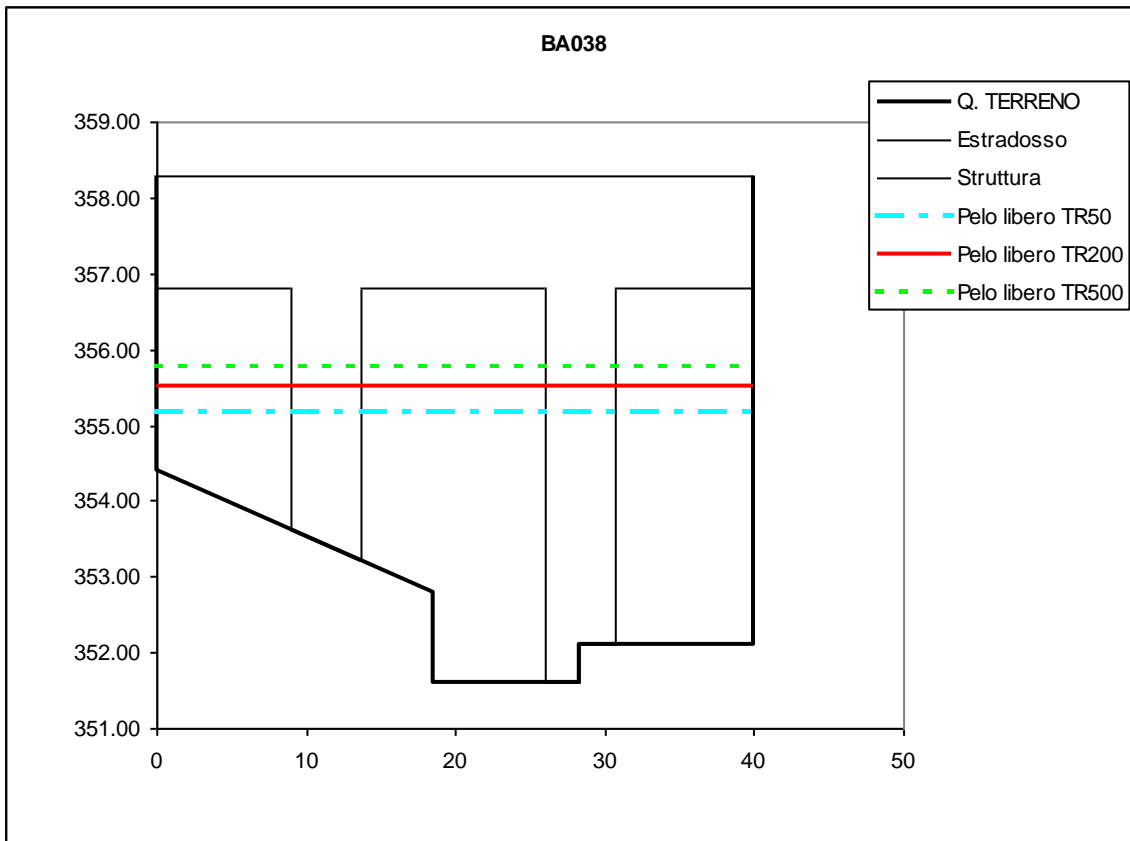
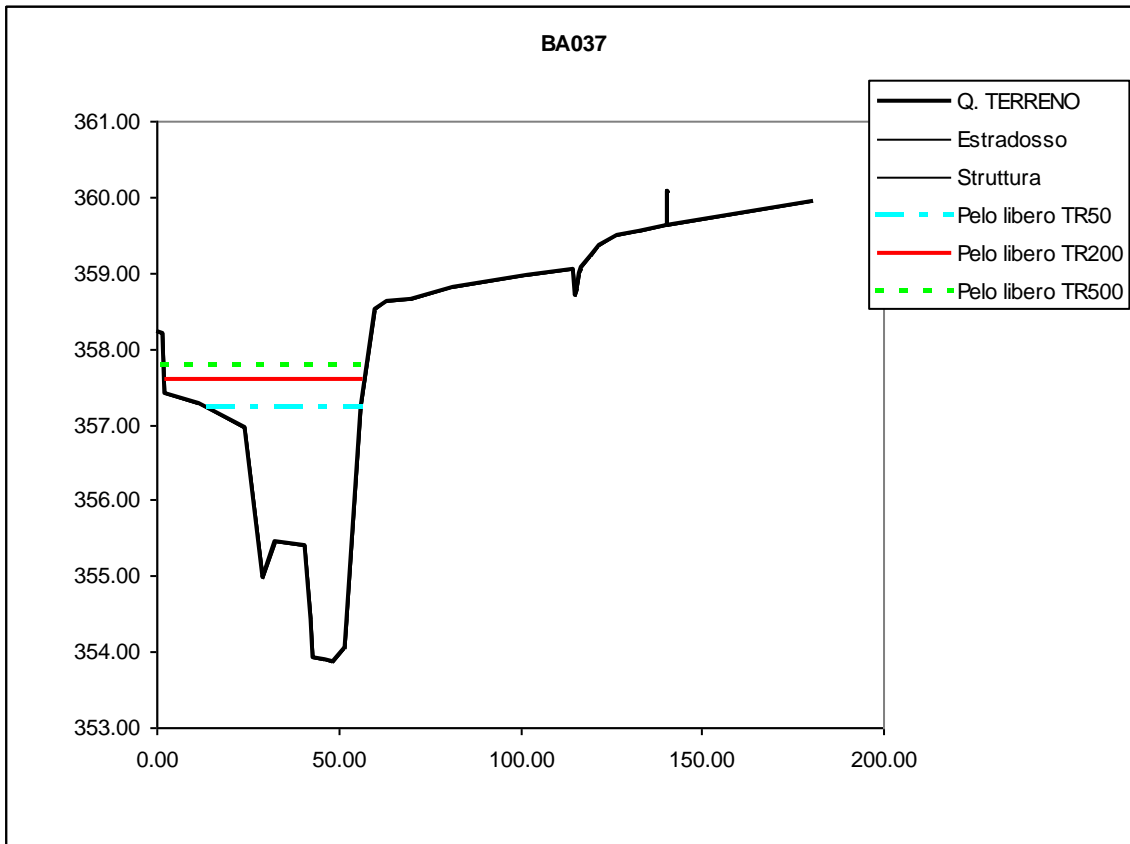


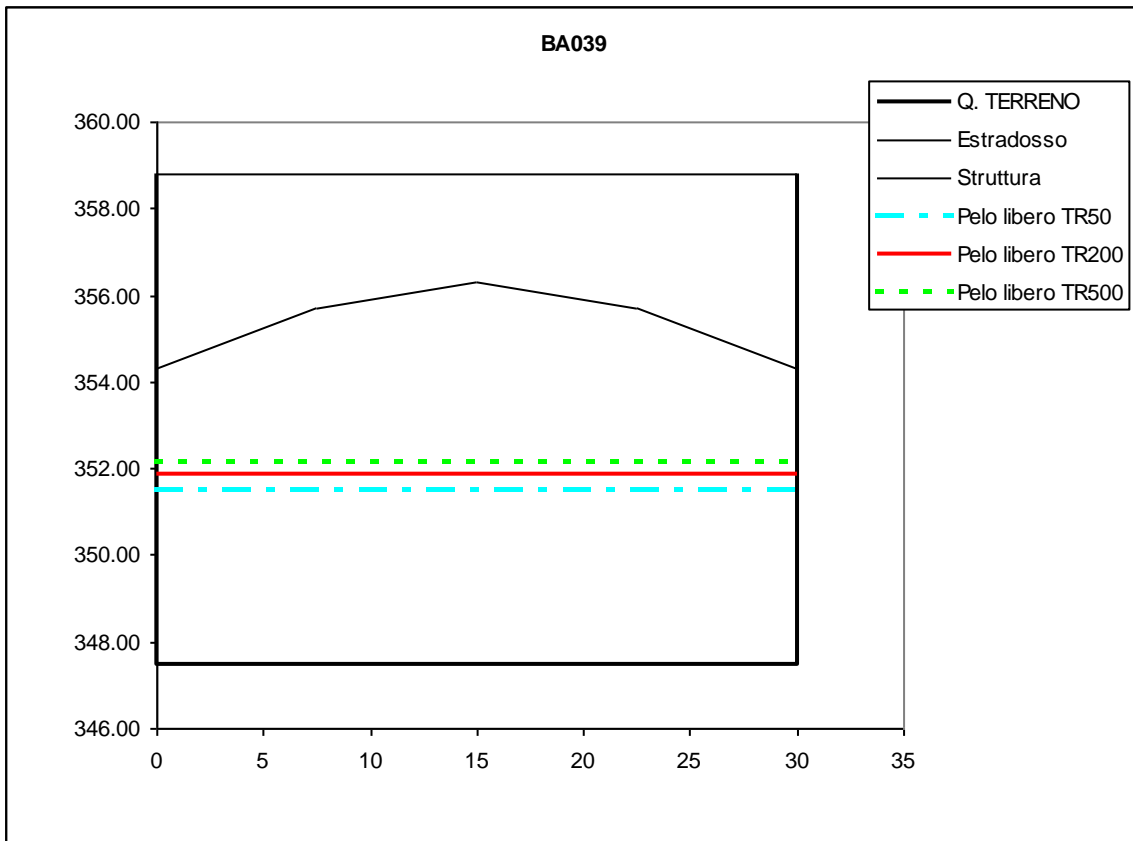
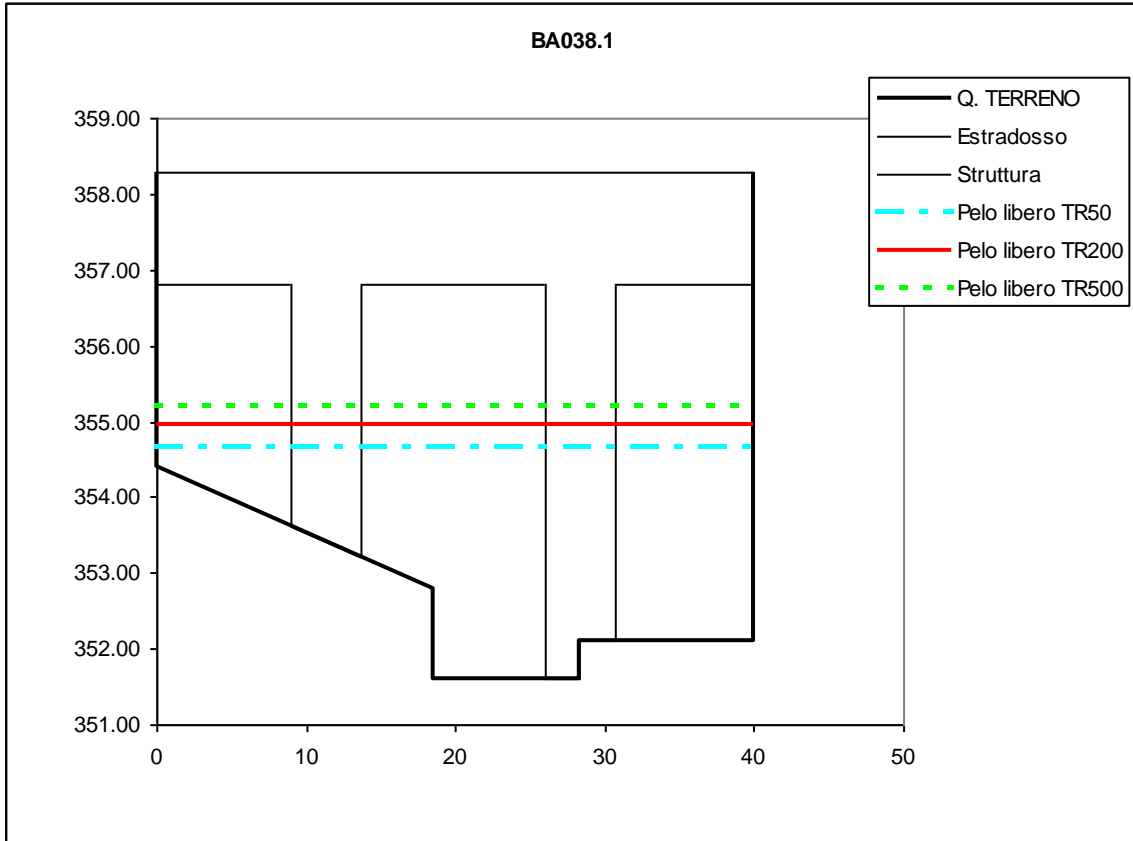


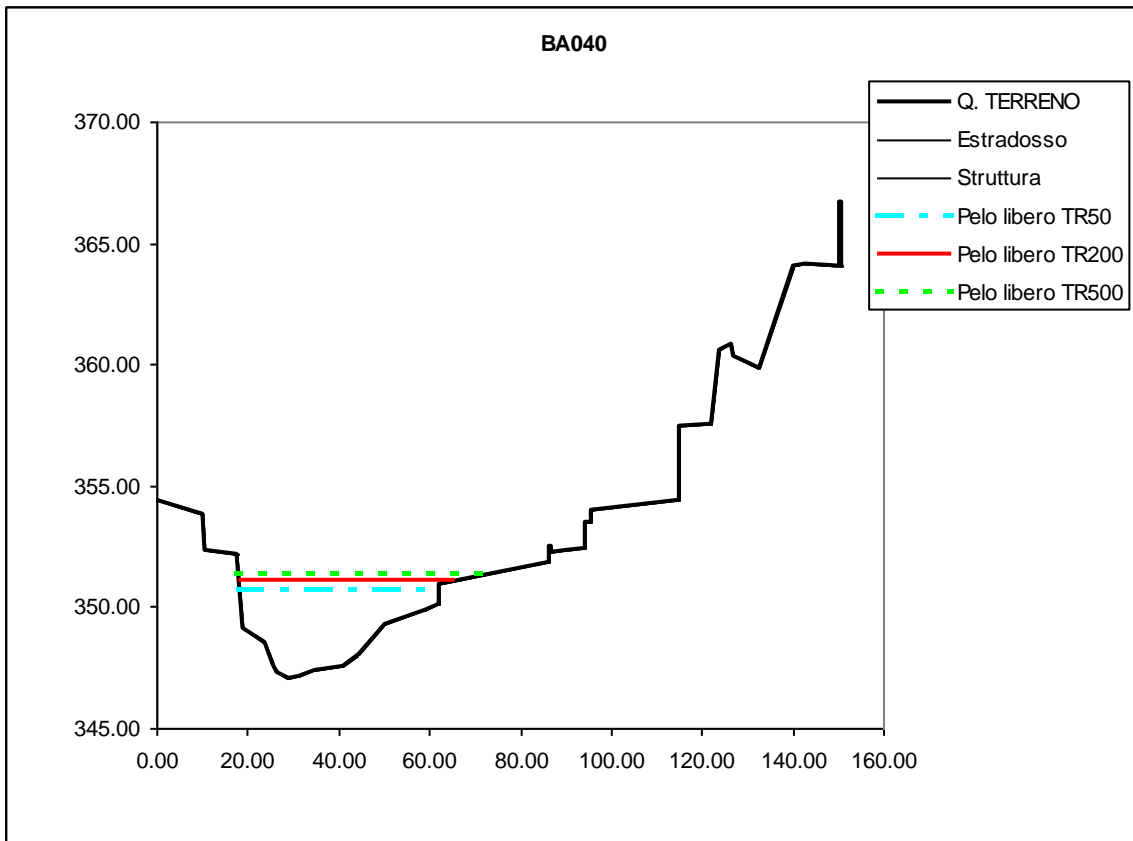
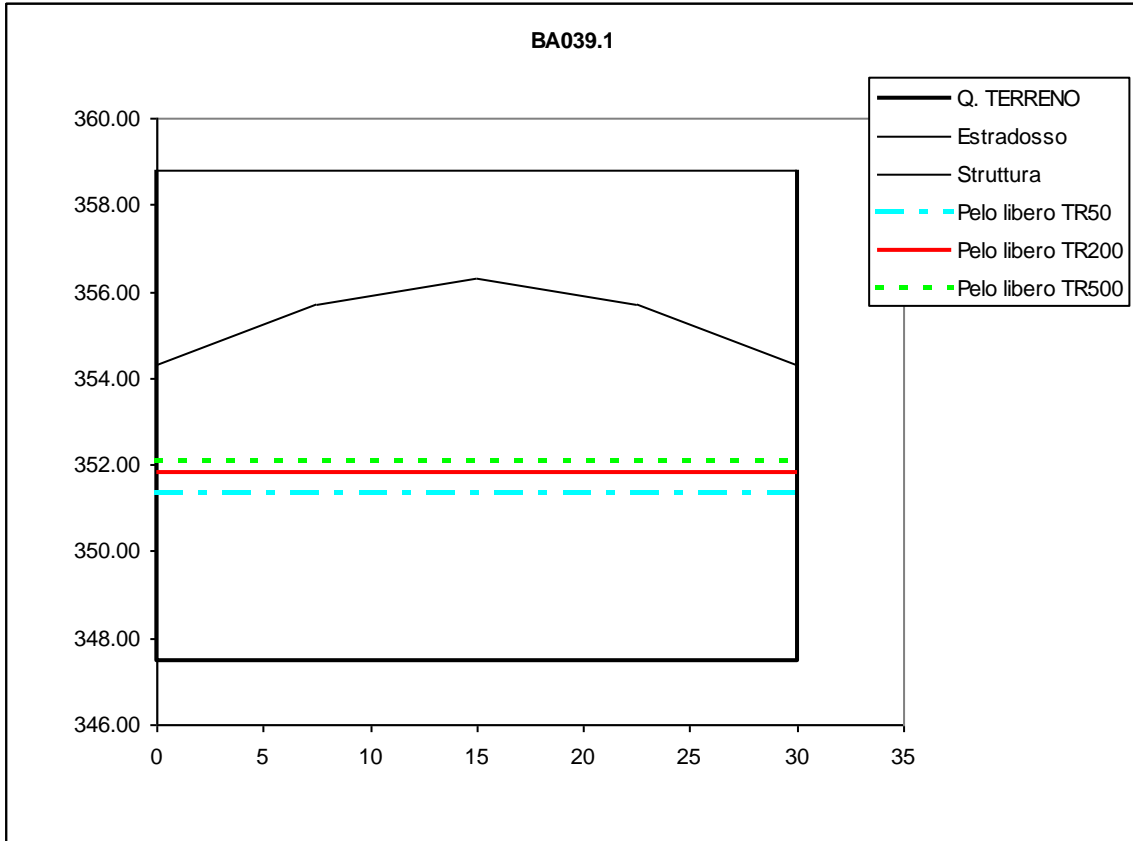




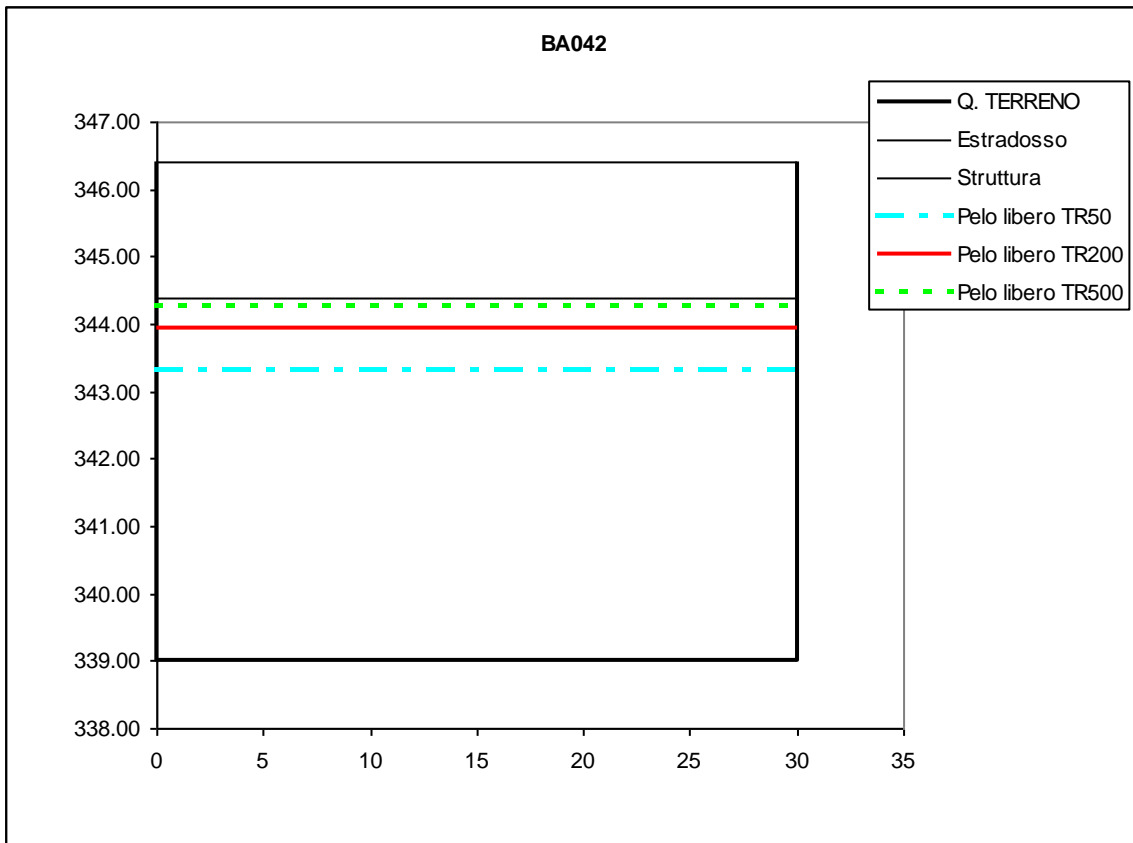
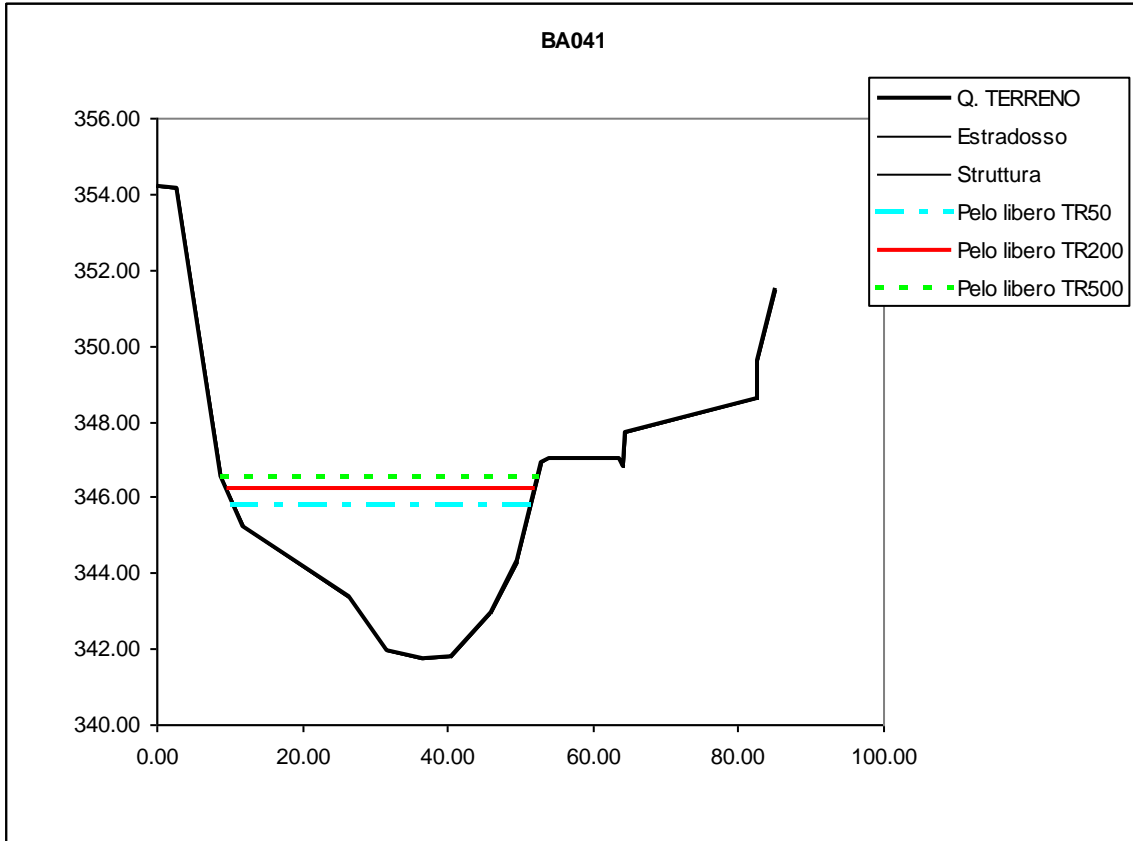


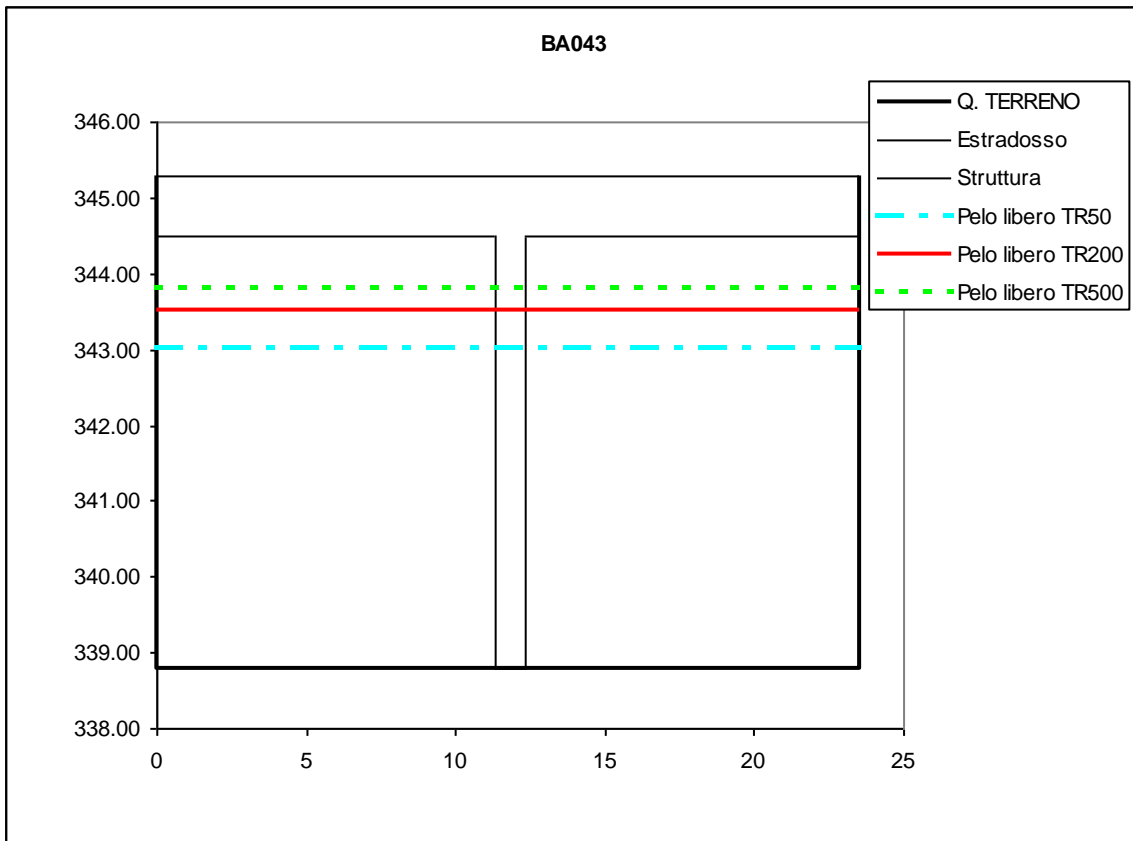
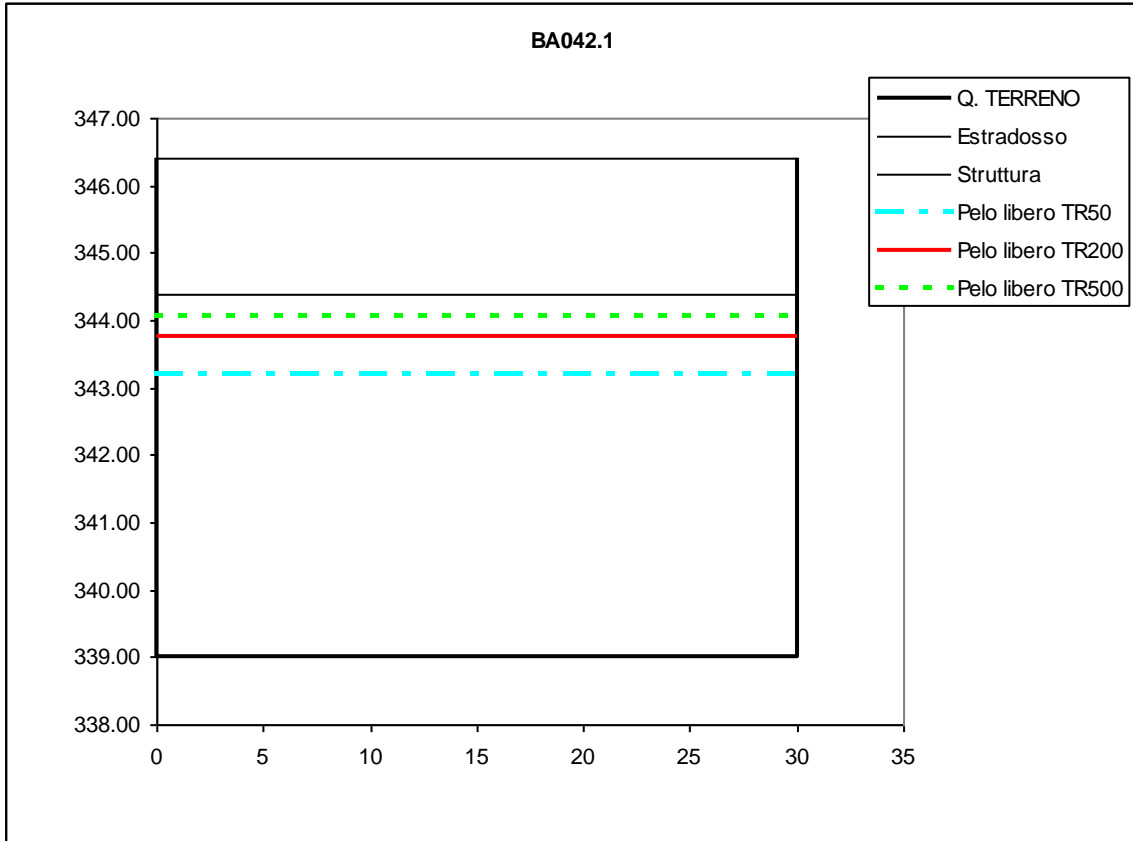


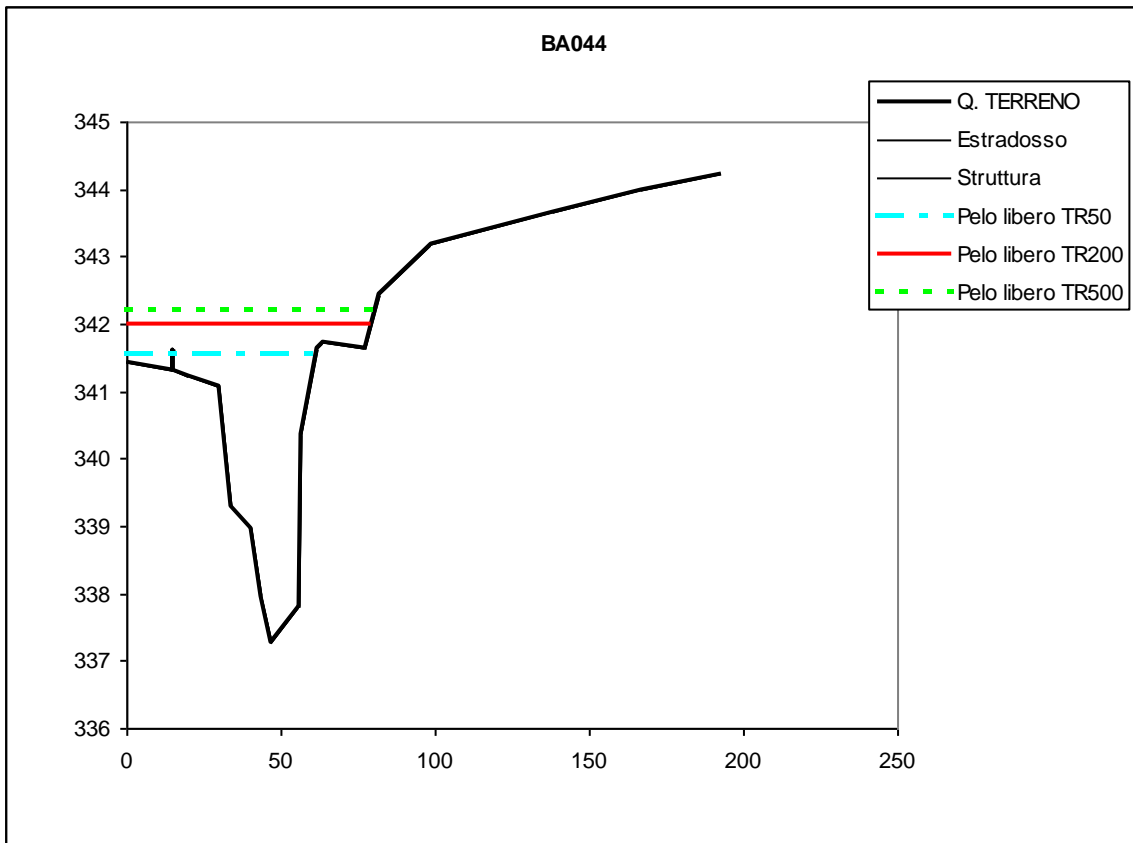
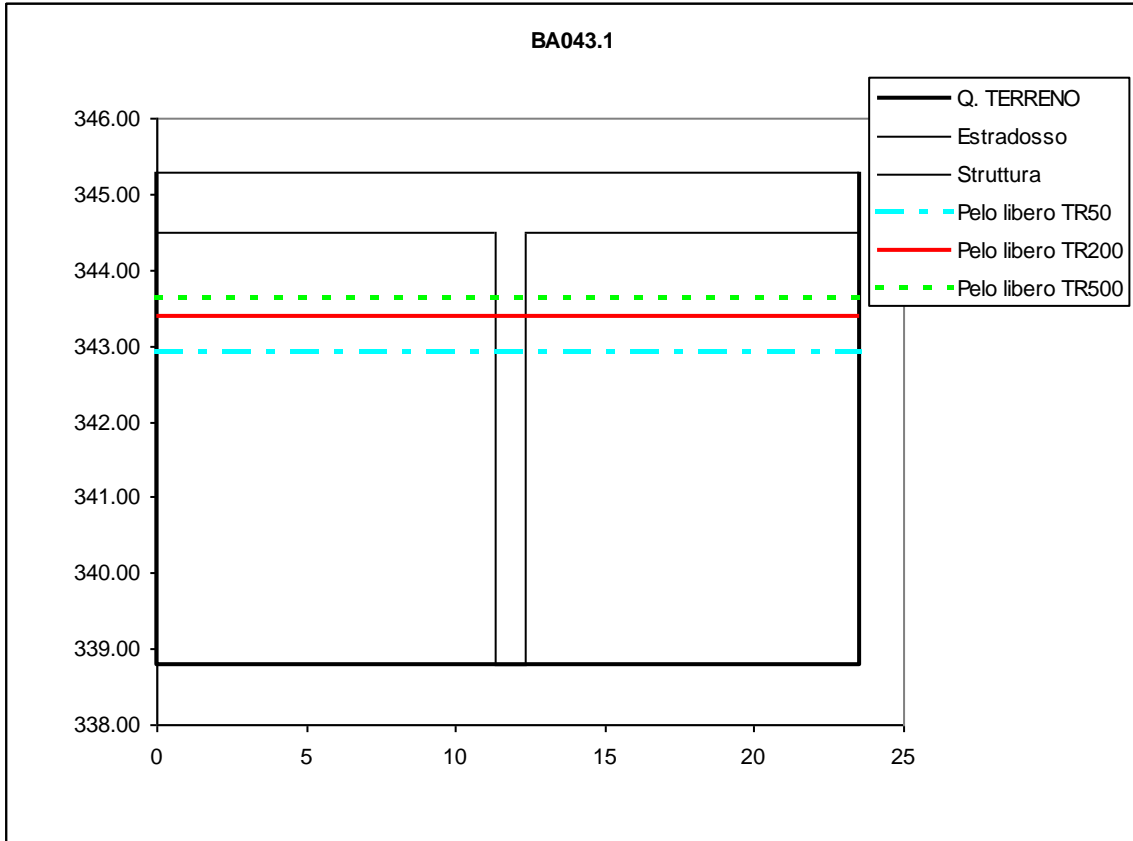


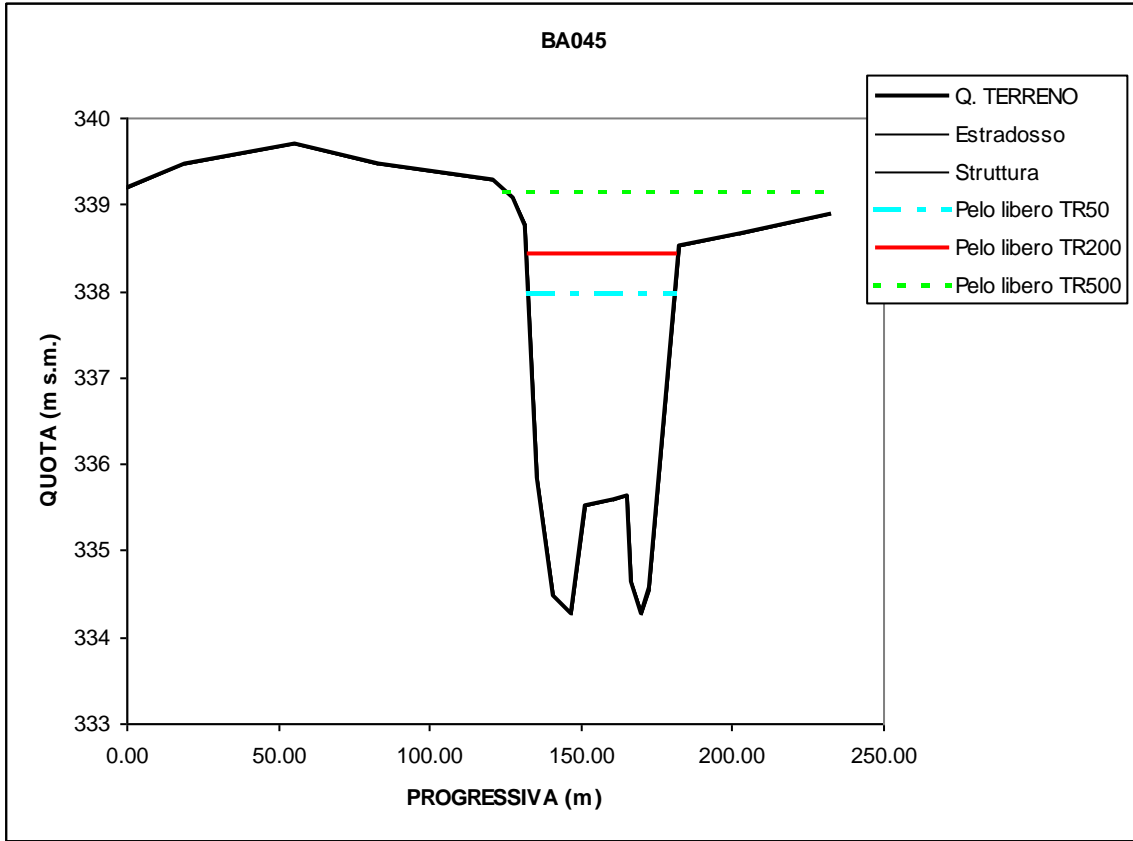




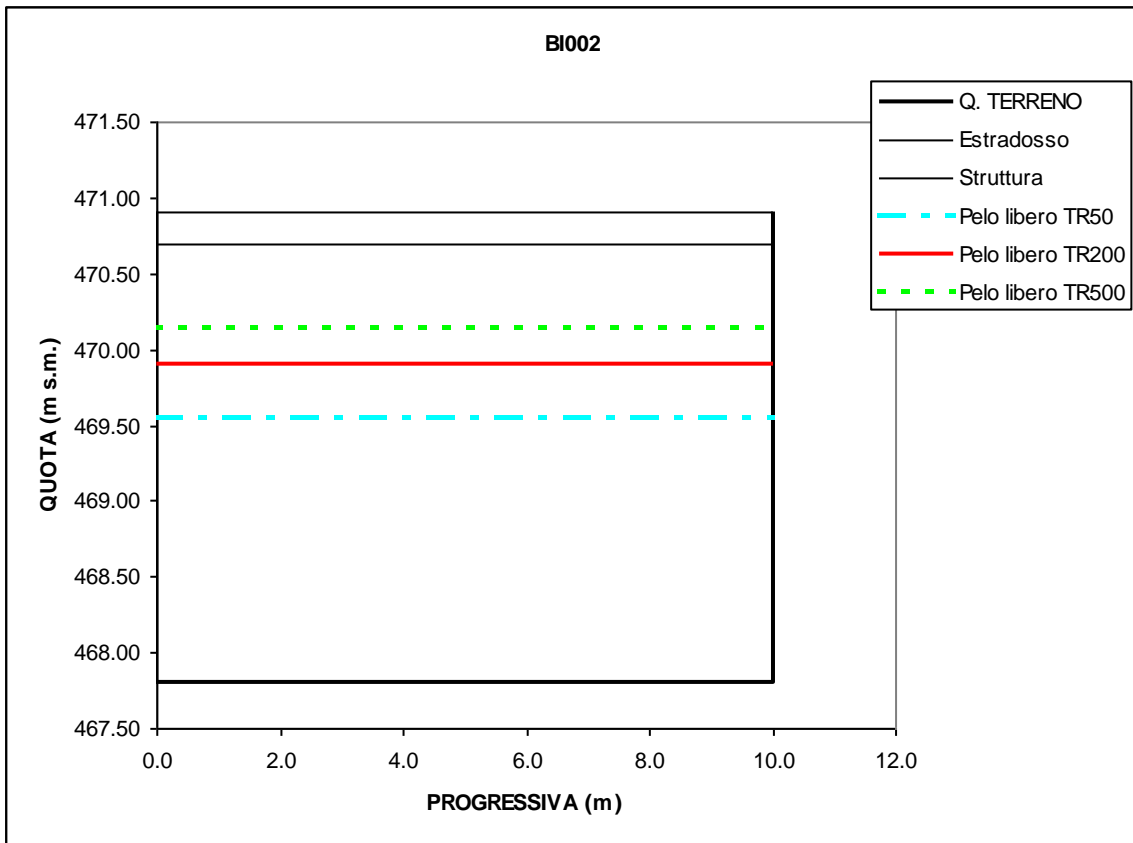
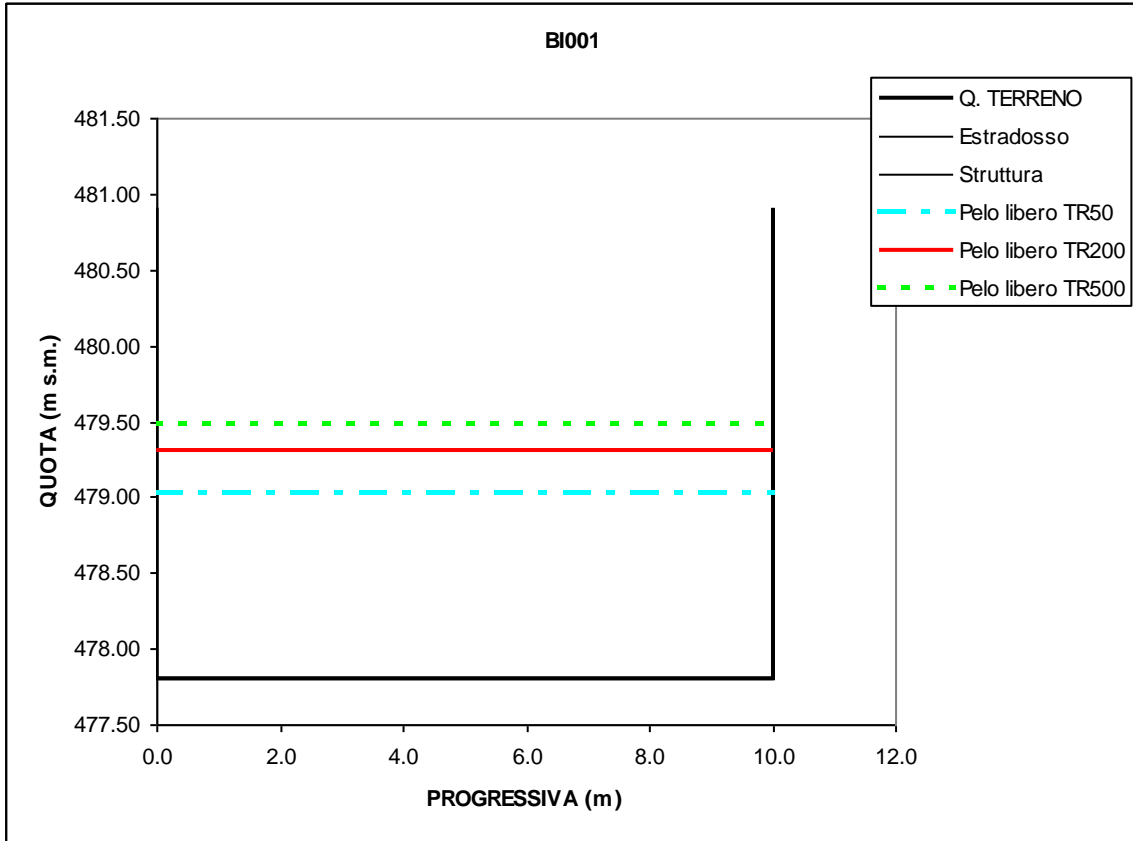


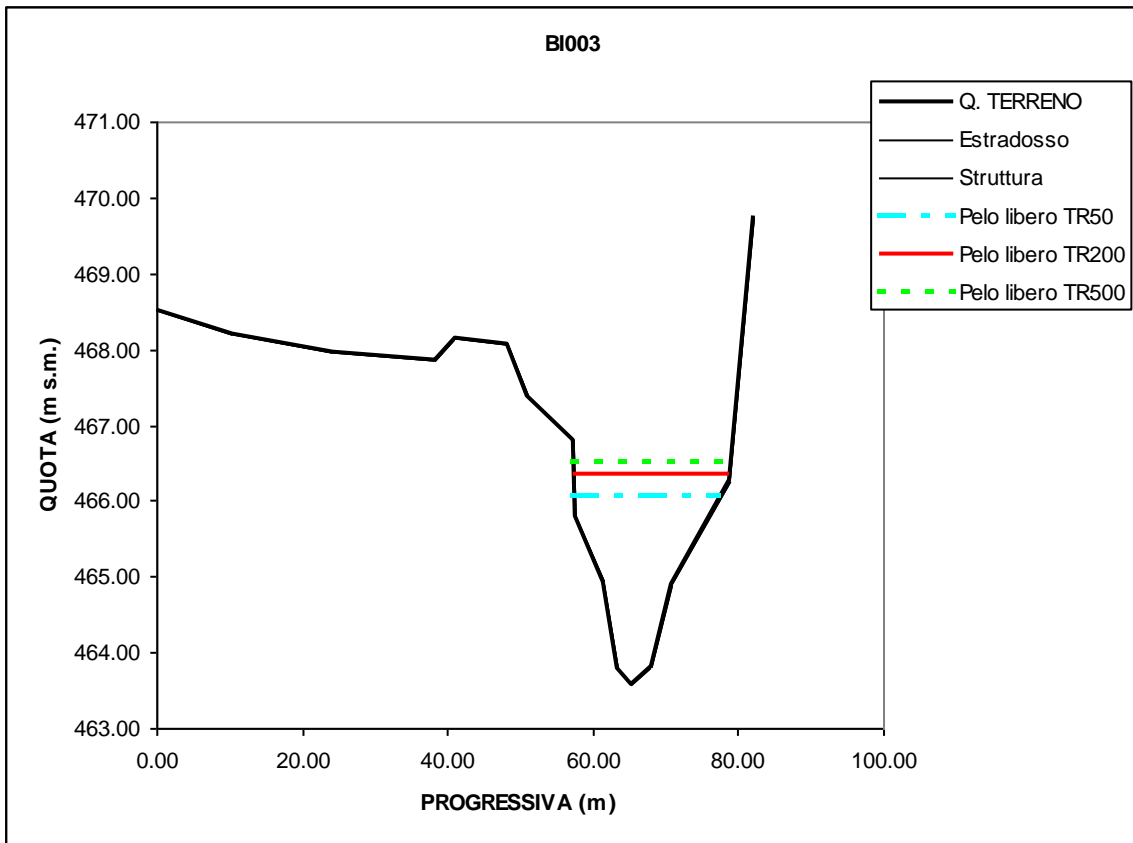
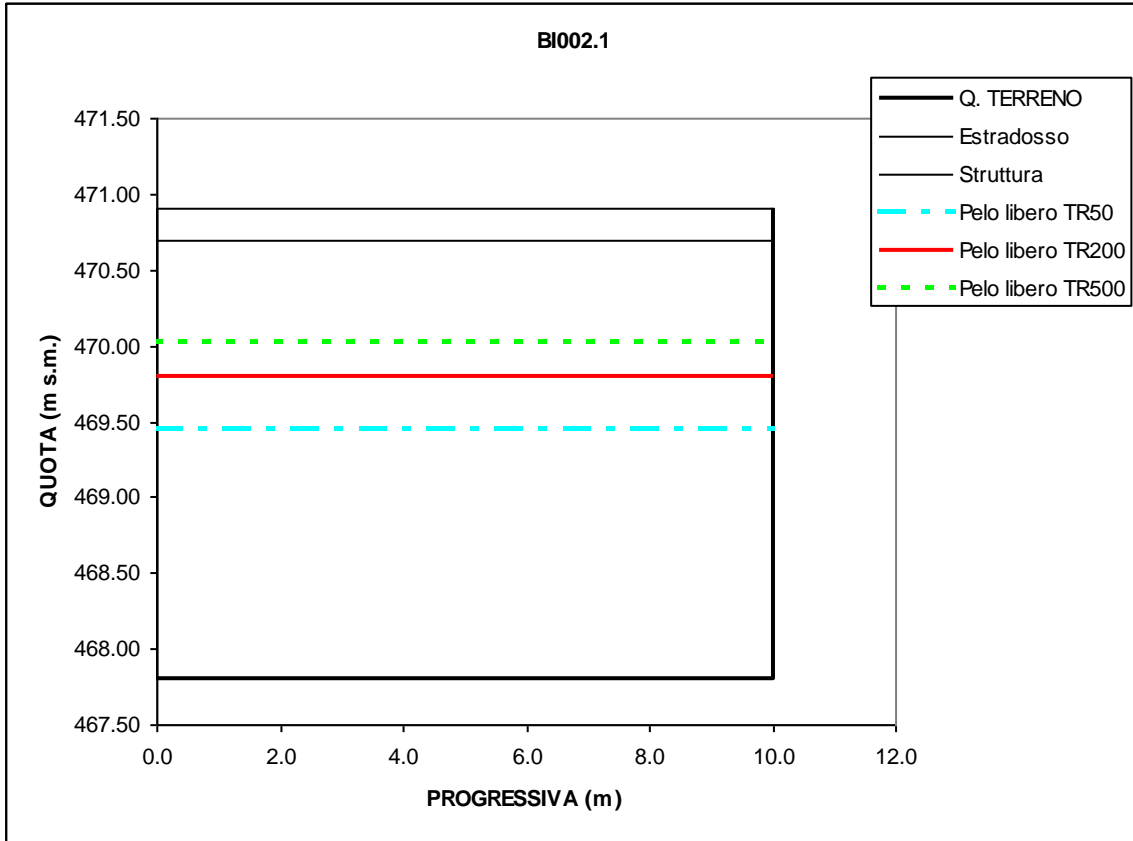


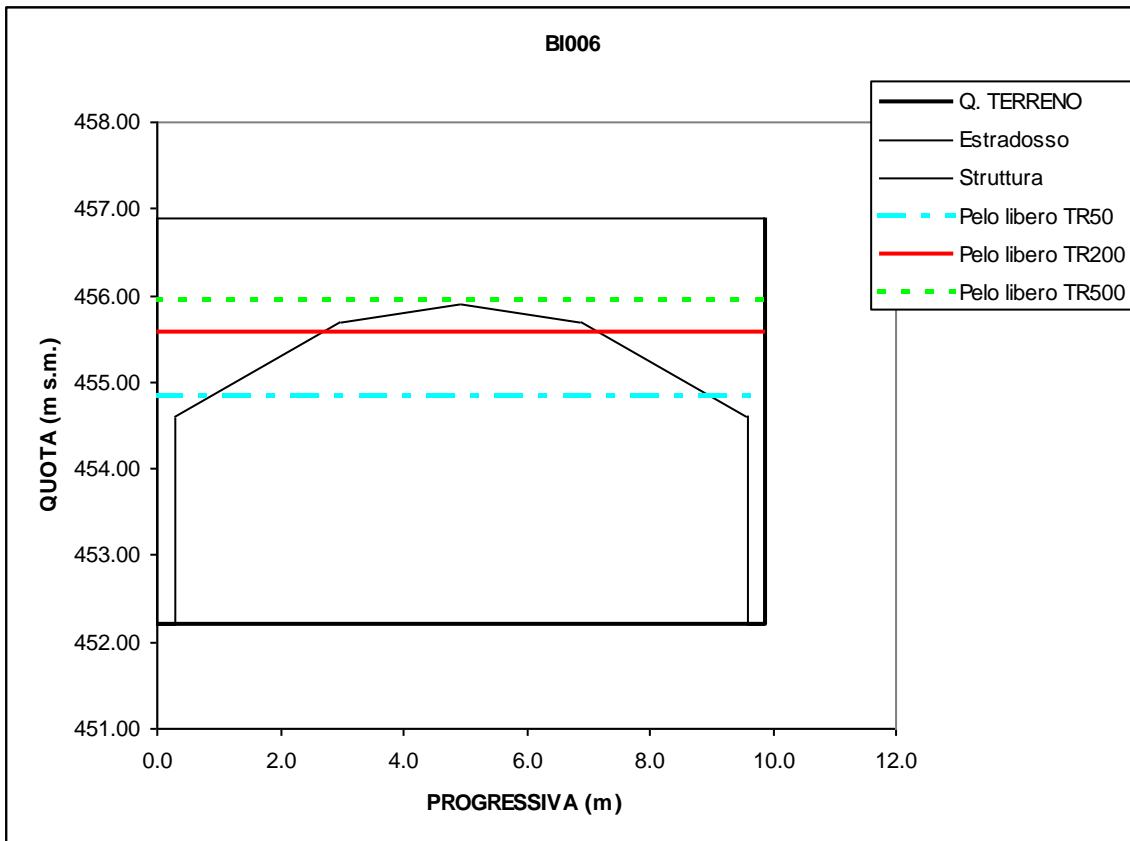
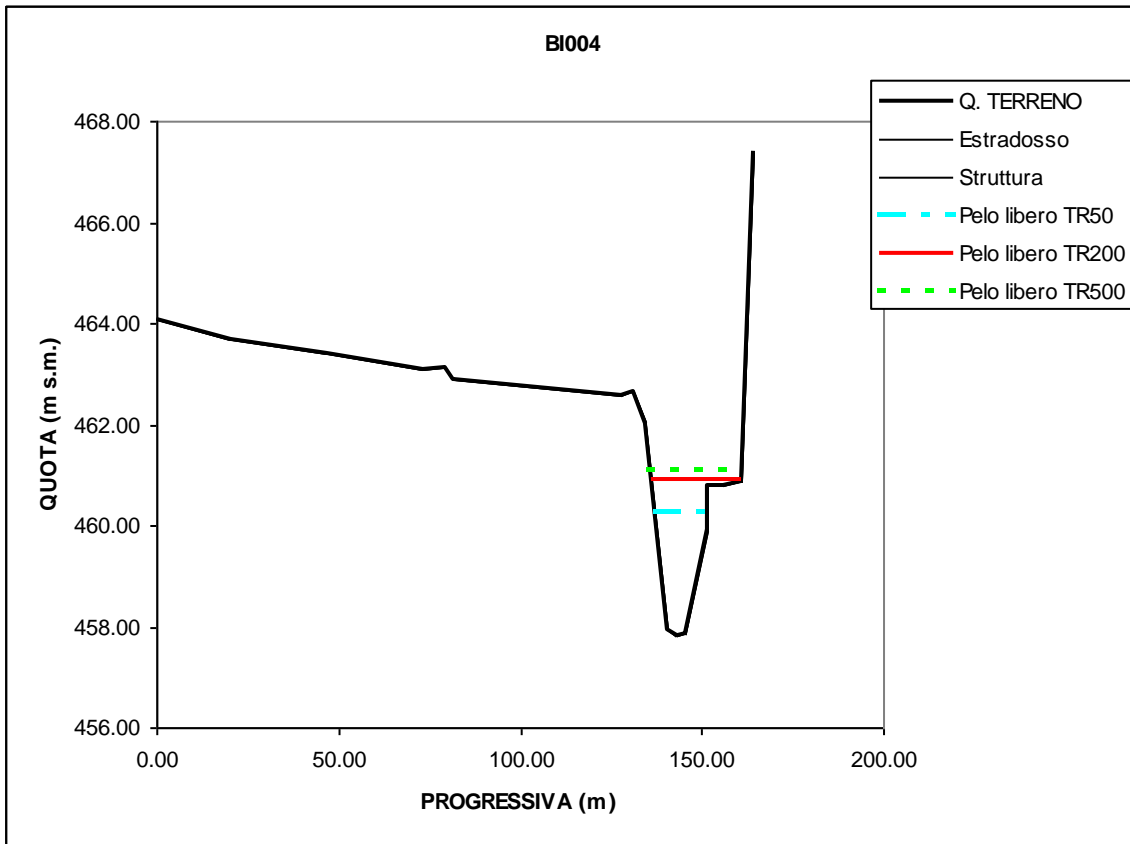




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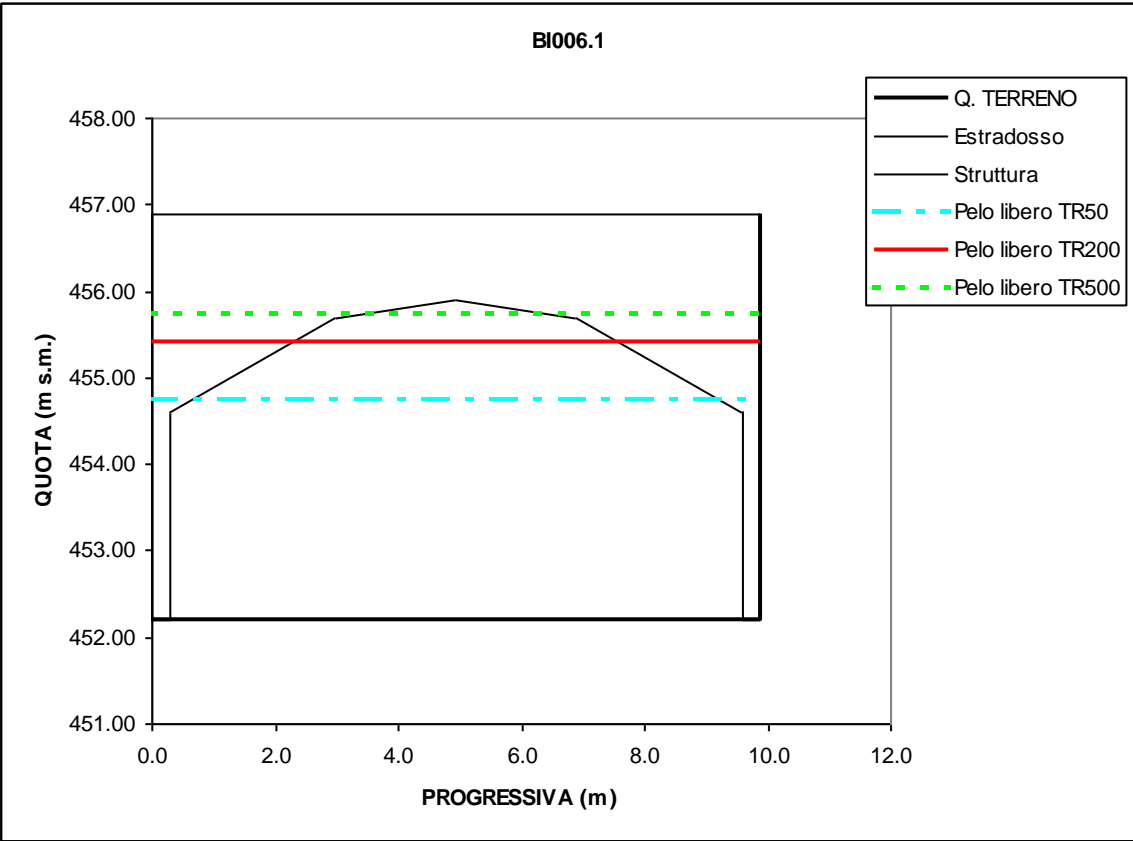




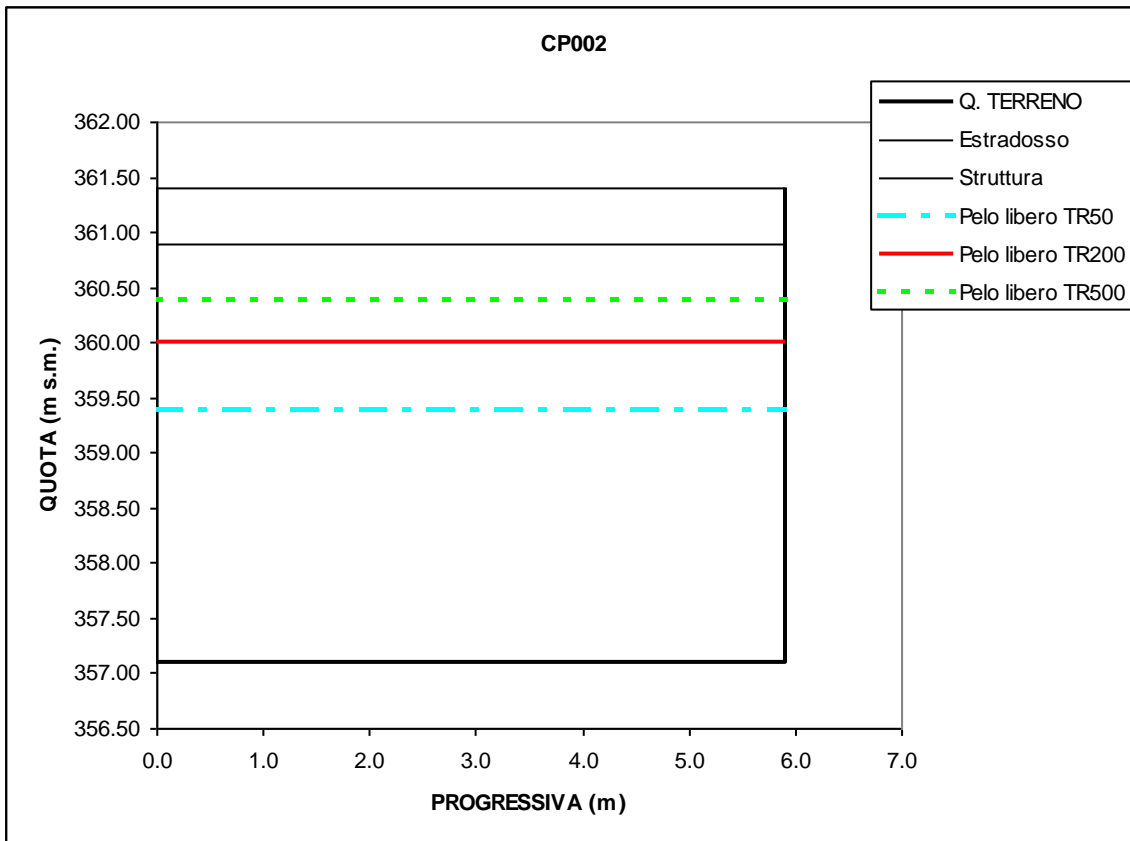
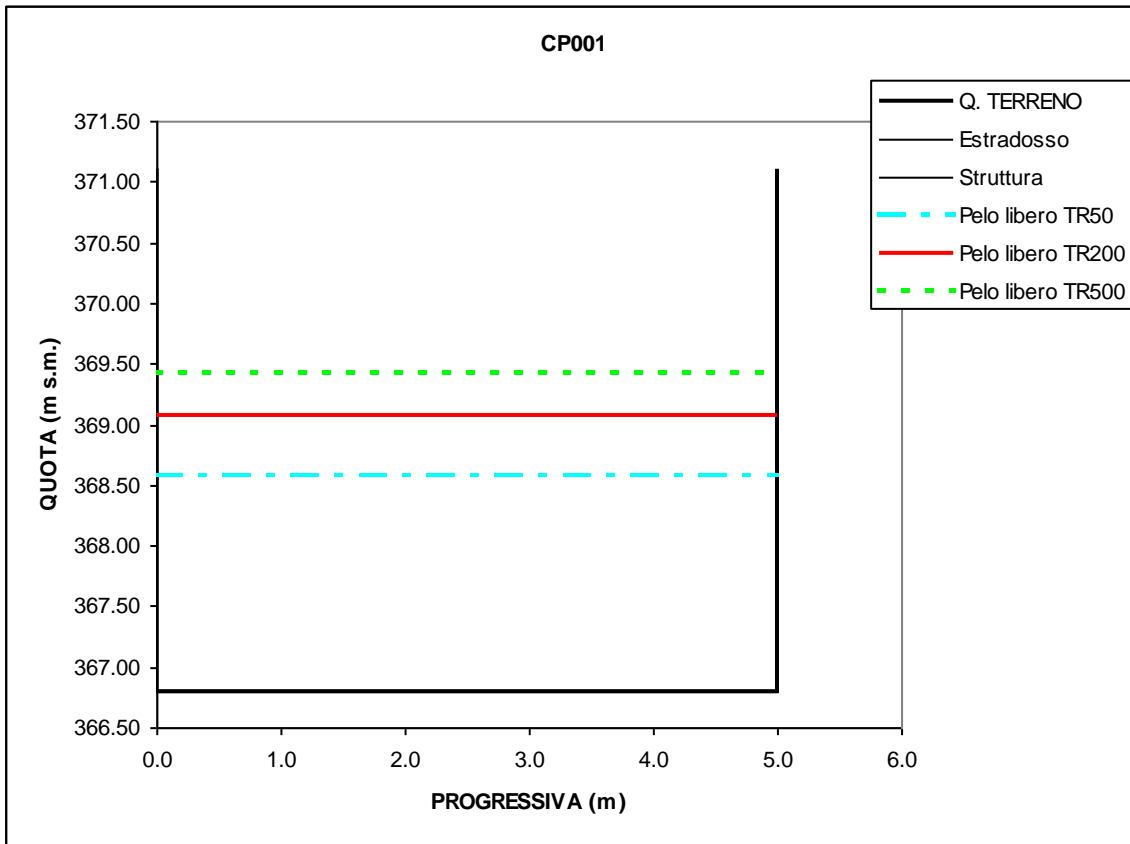


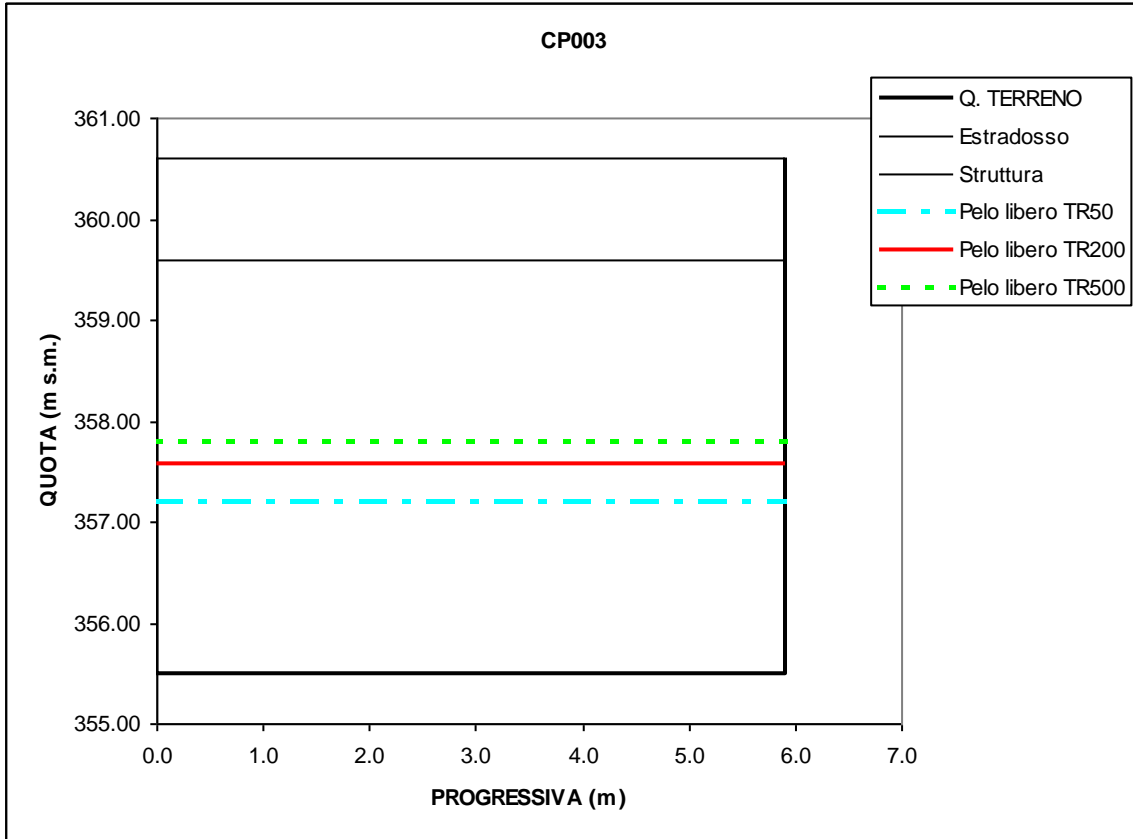


BI006.1

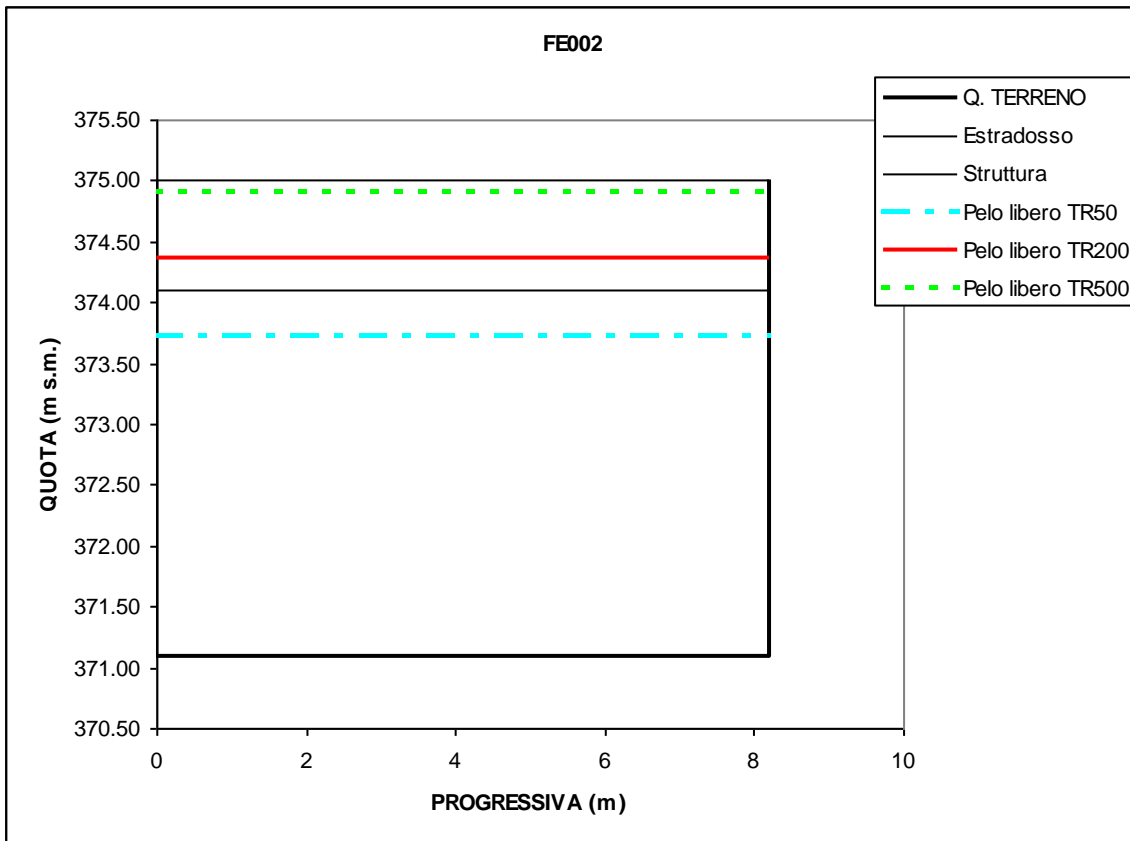
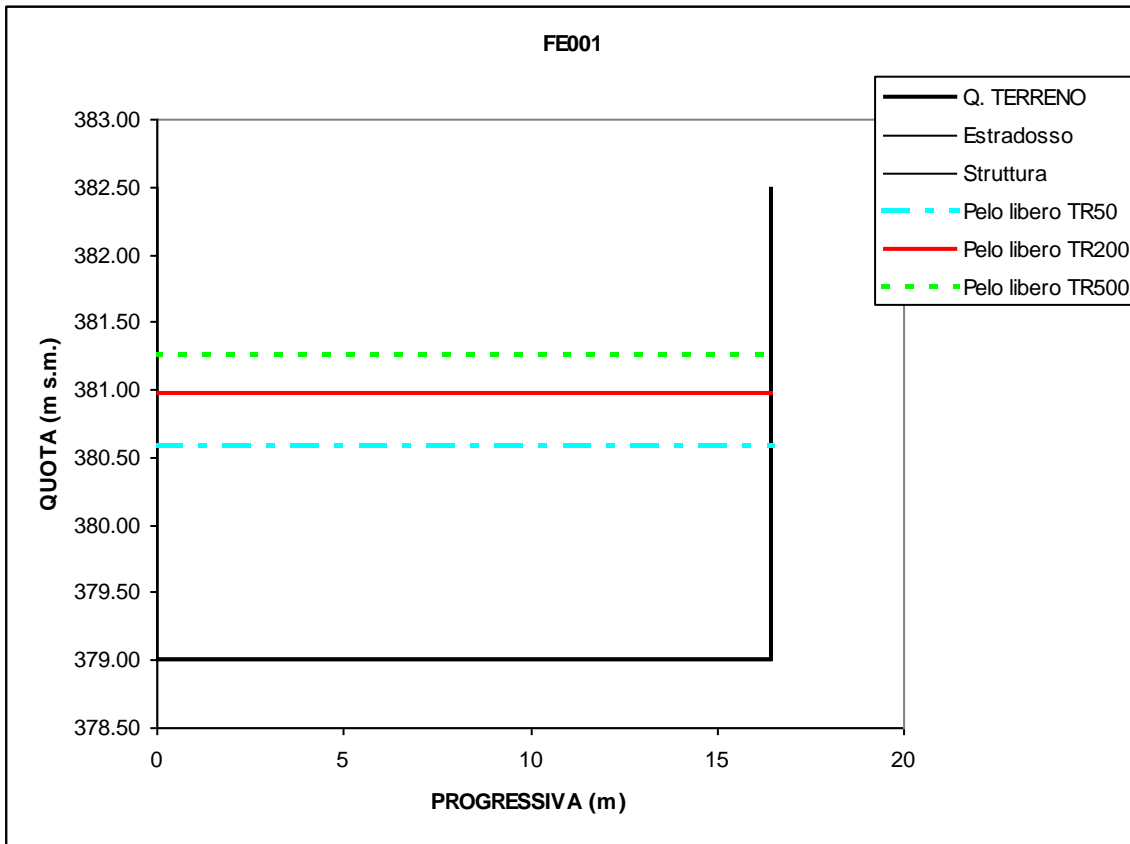


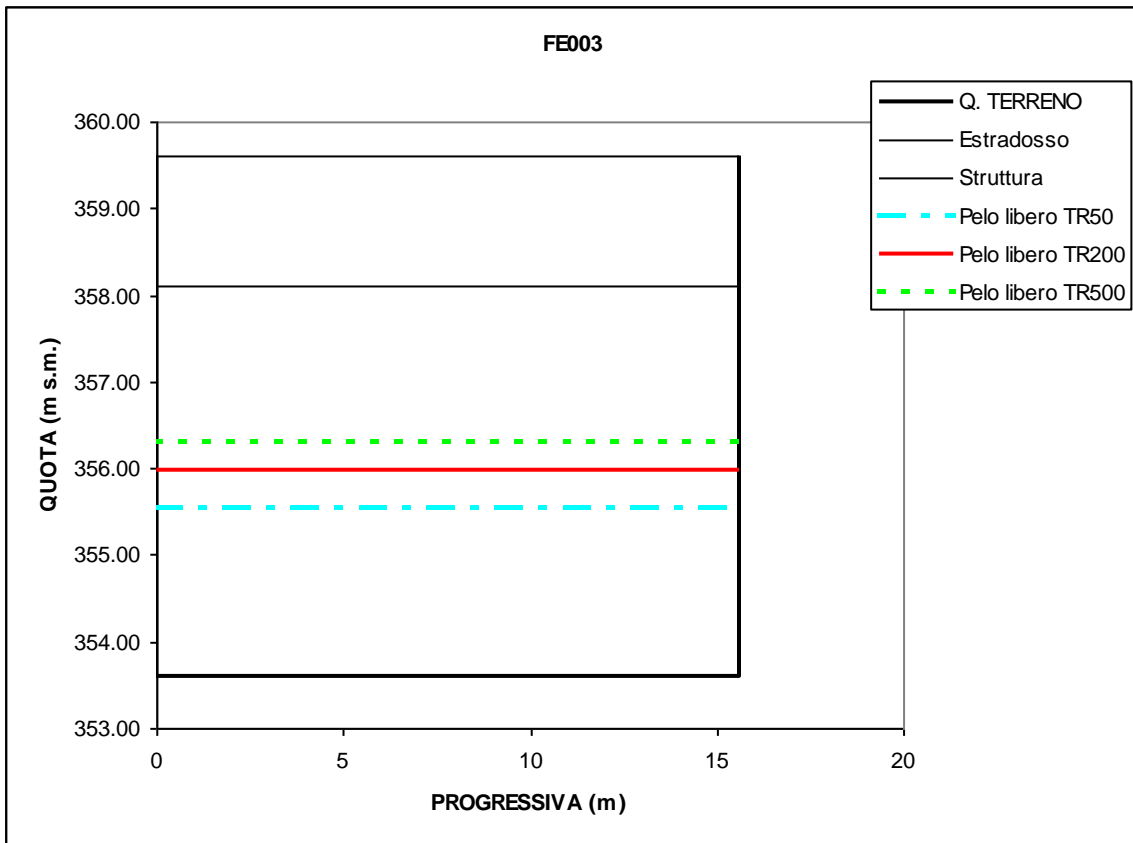
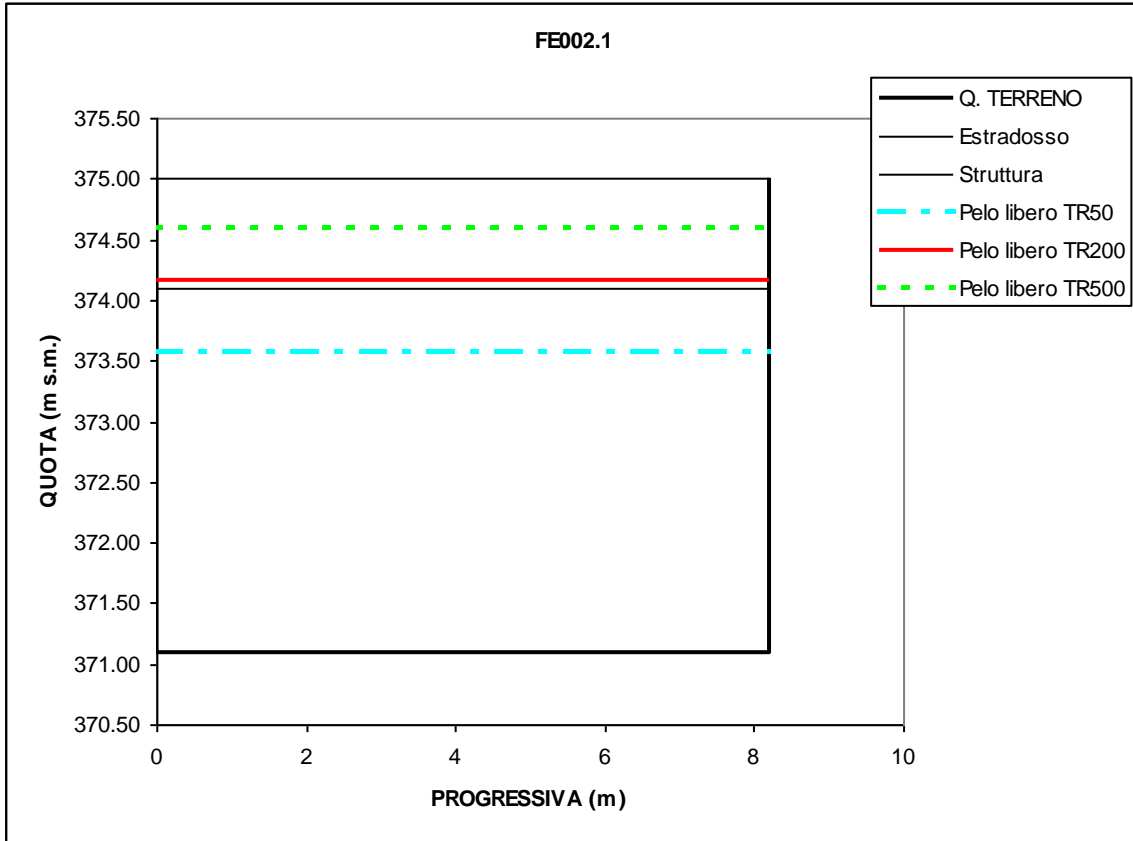
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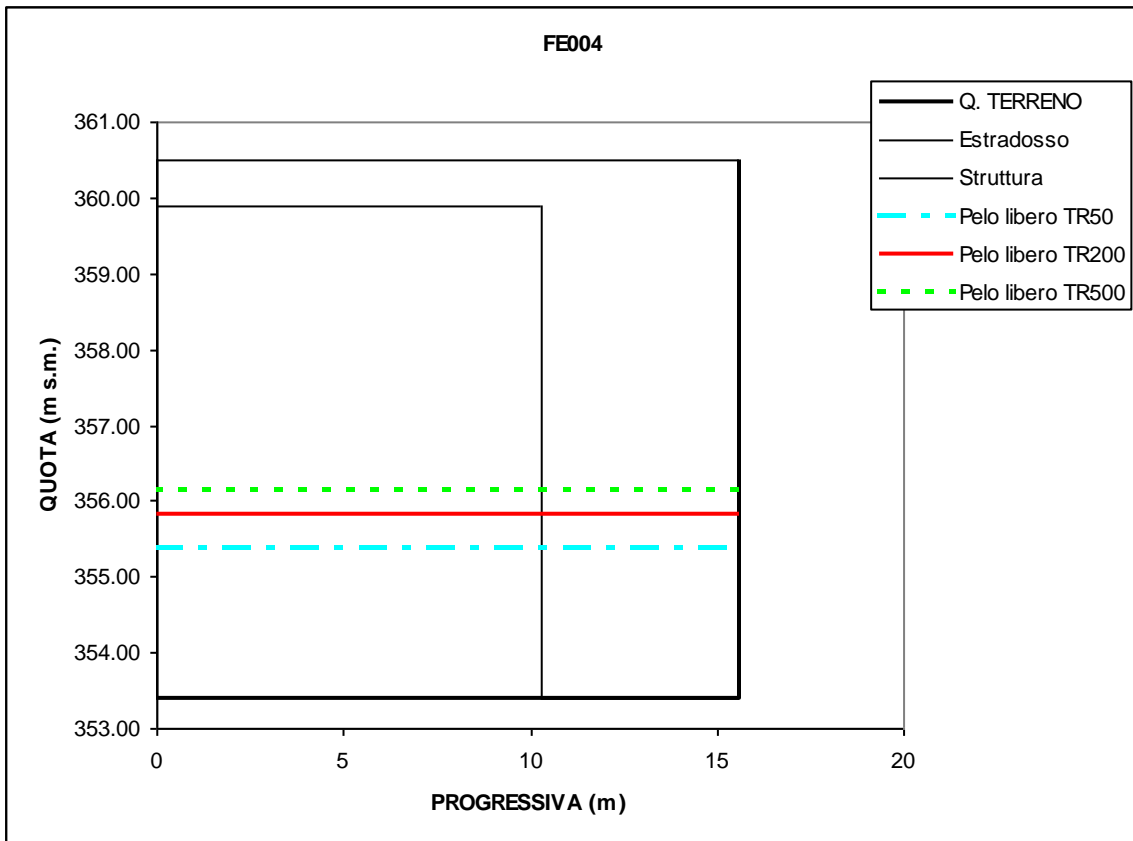
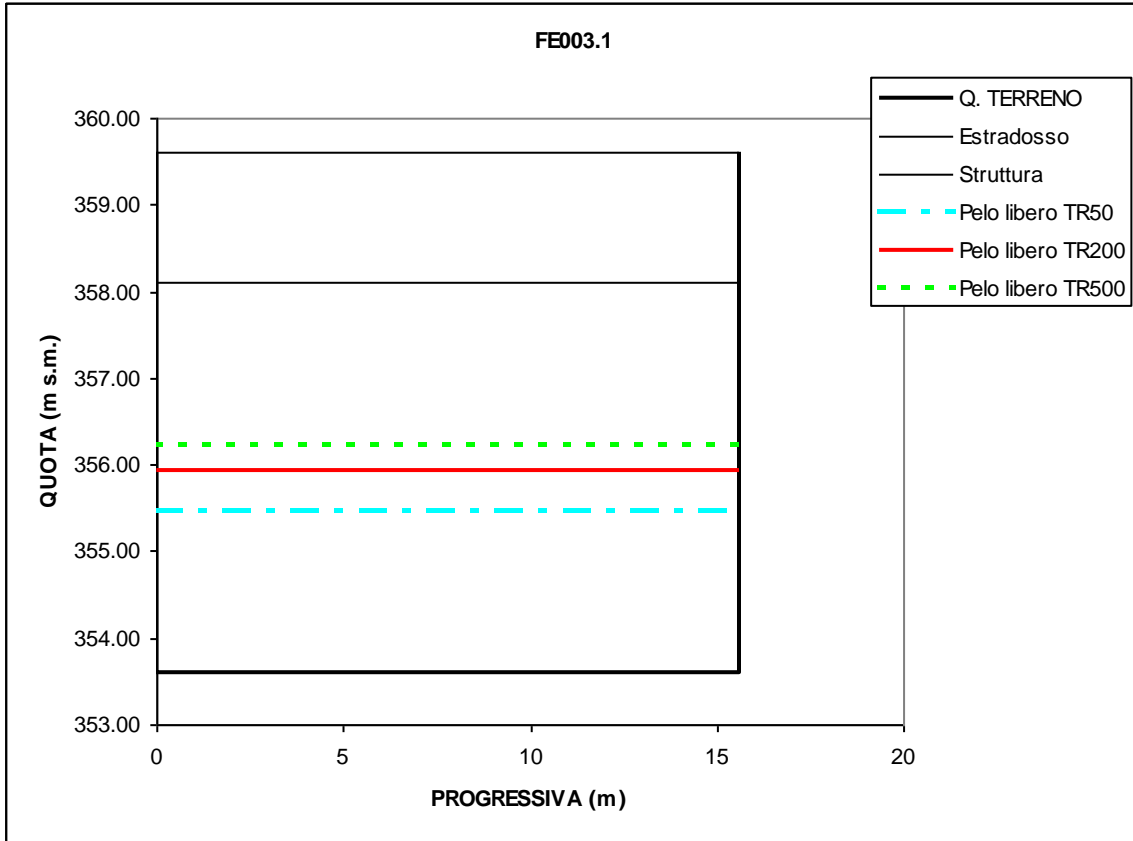




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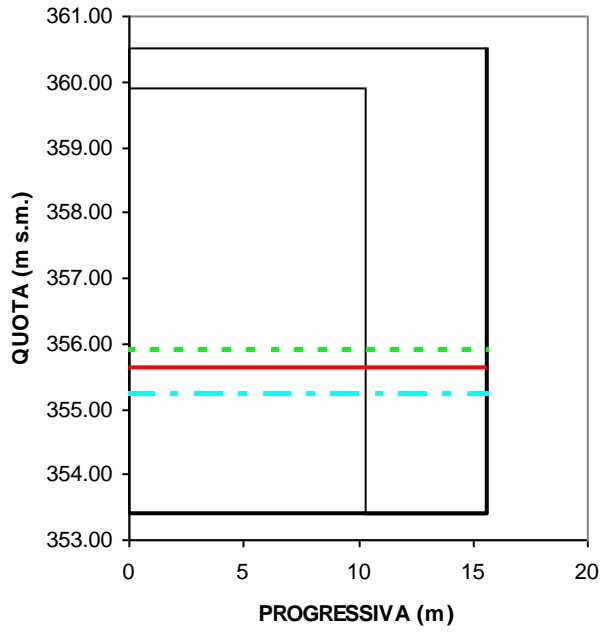






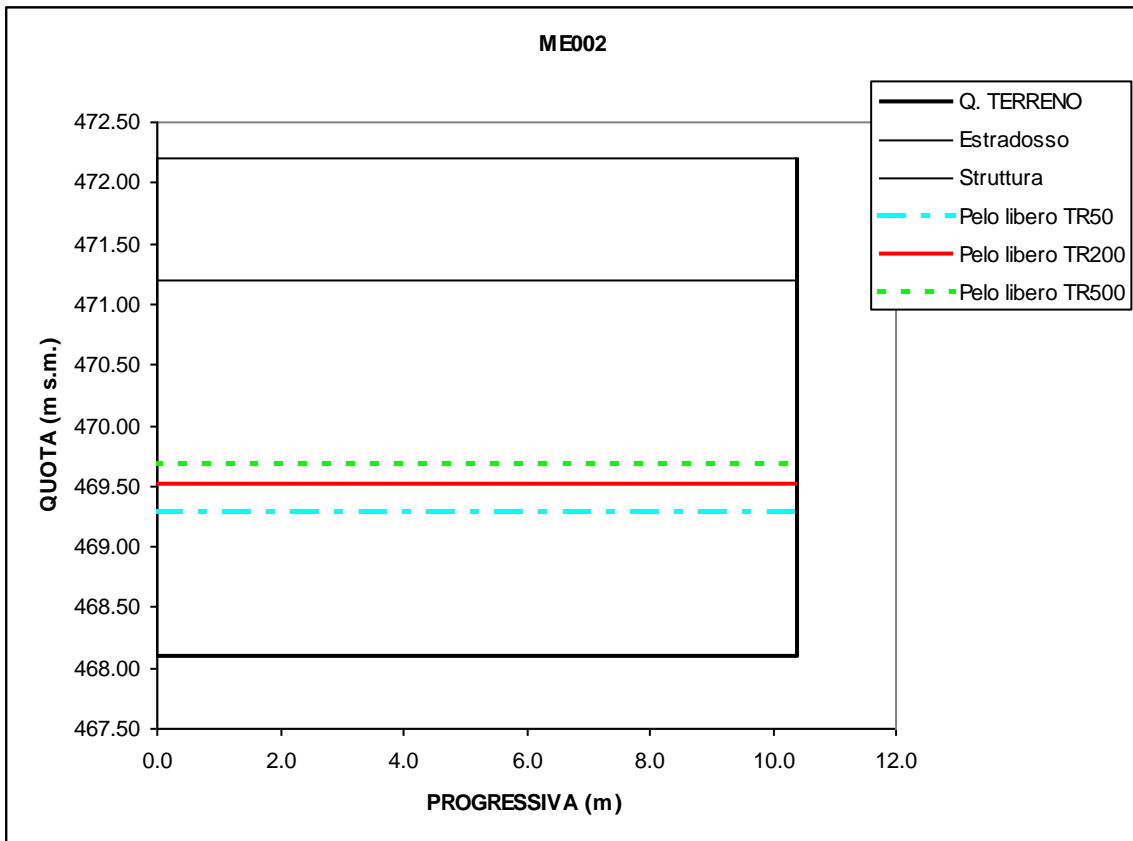
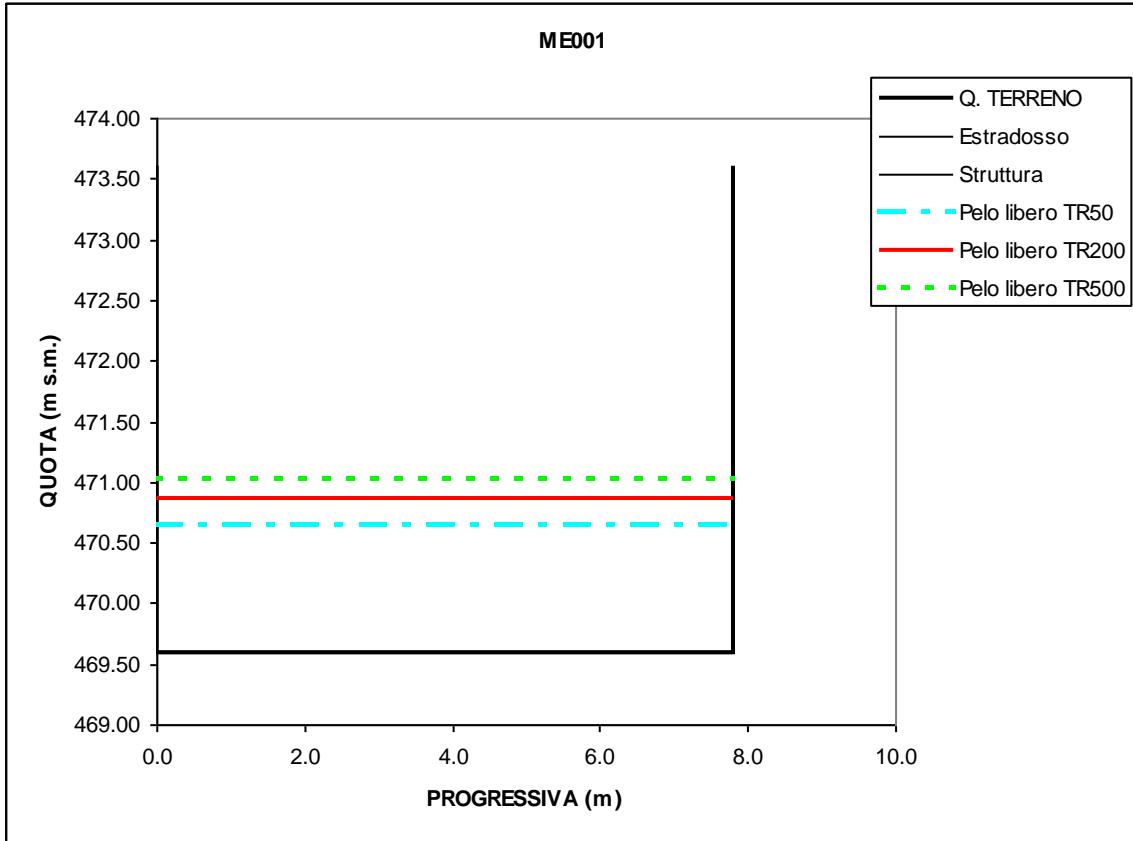


FE004.1

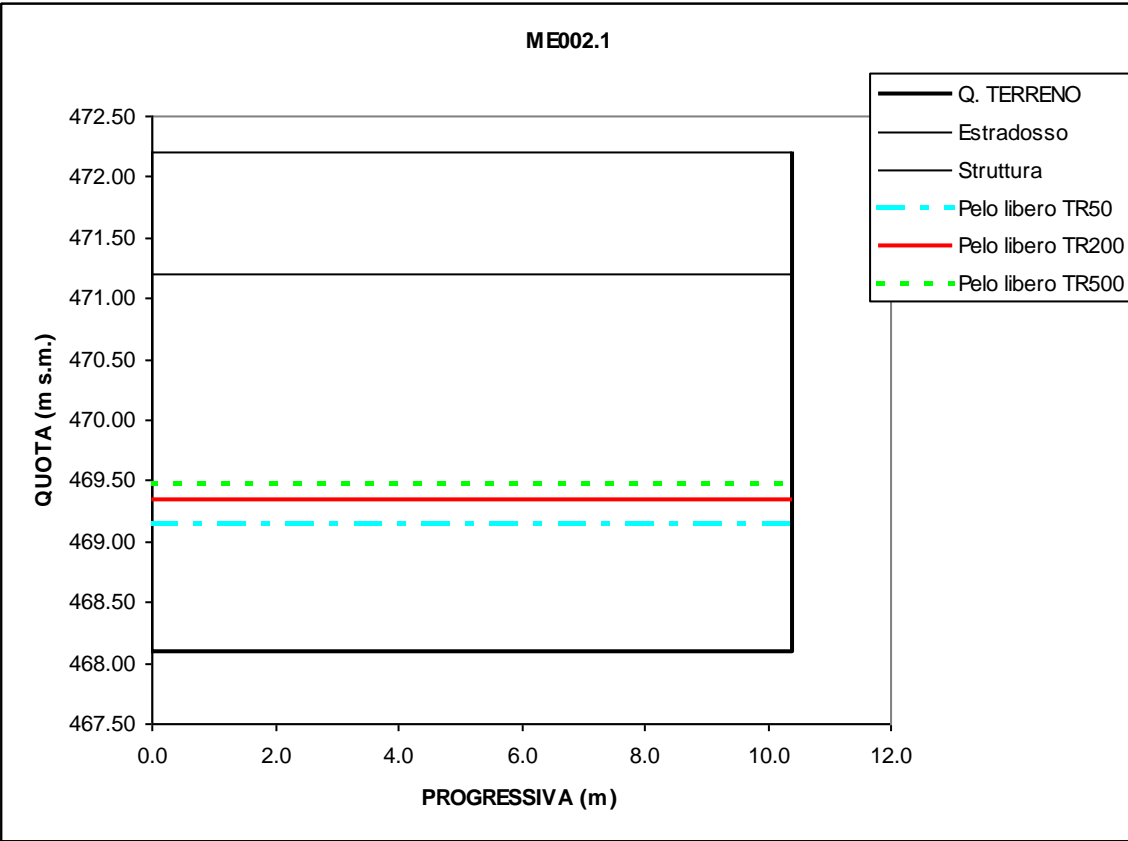


- Q. TERRENO
- Estradosso
- Struttura
- - - Pelo libero TR50
- Pelo libero TR200
- - - Pelo libero TR500

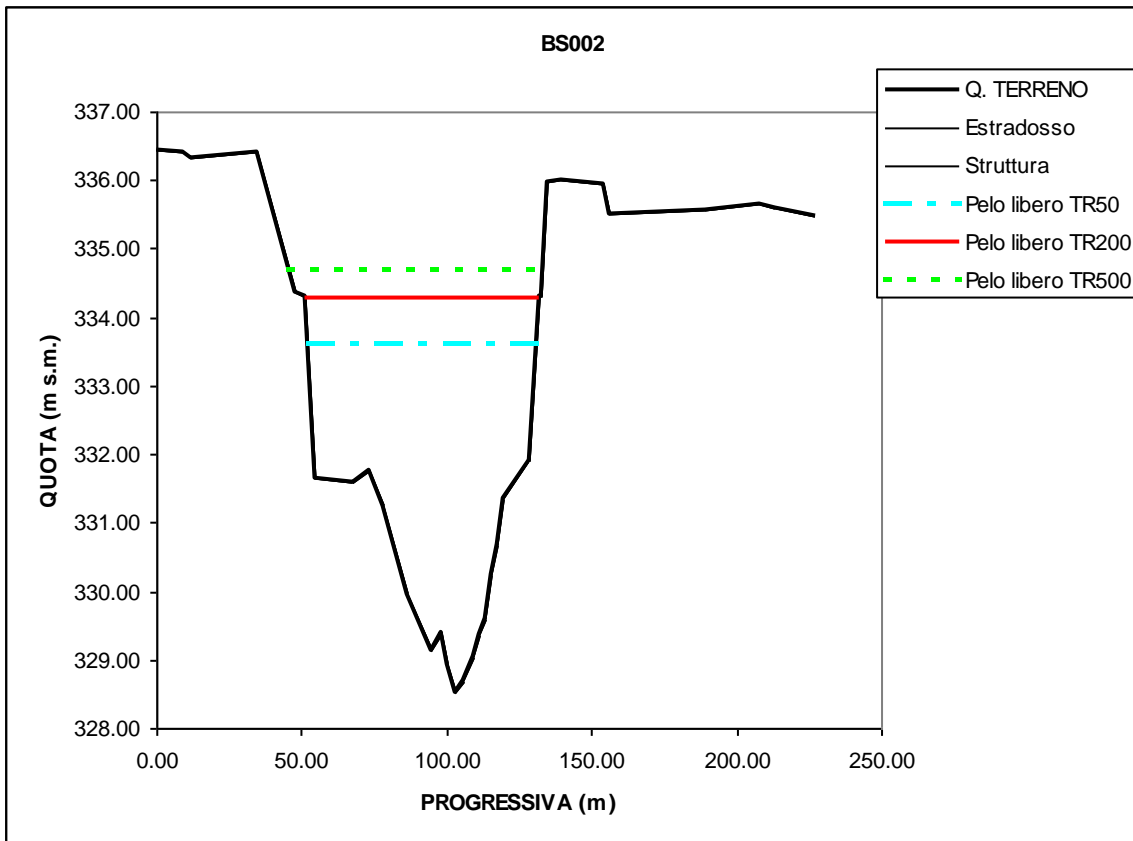
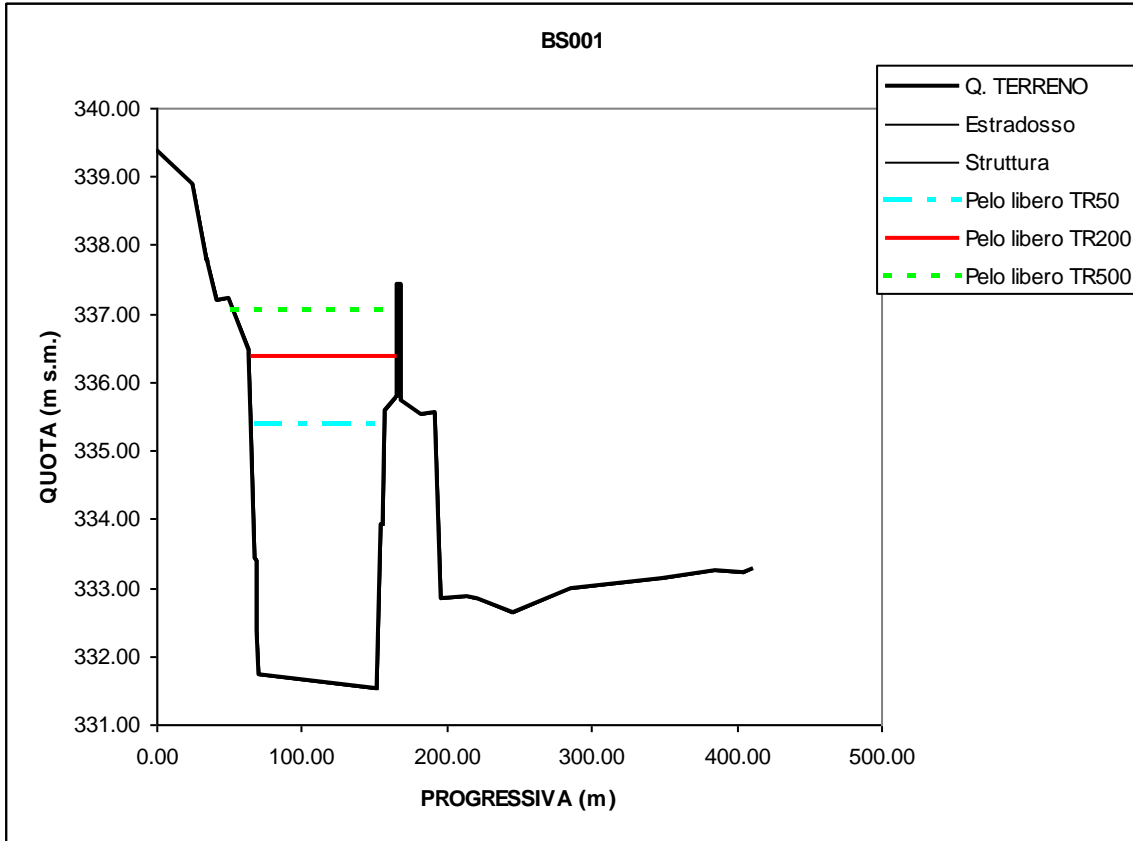
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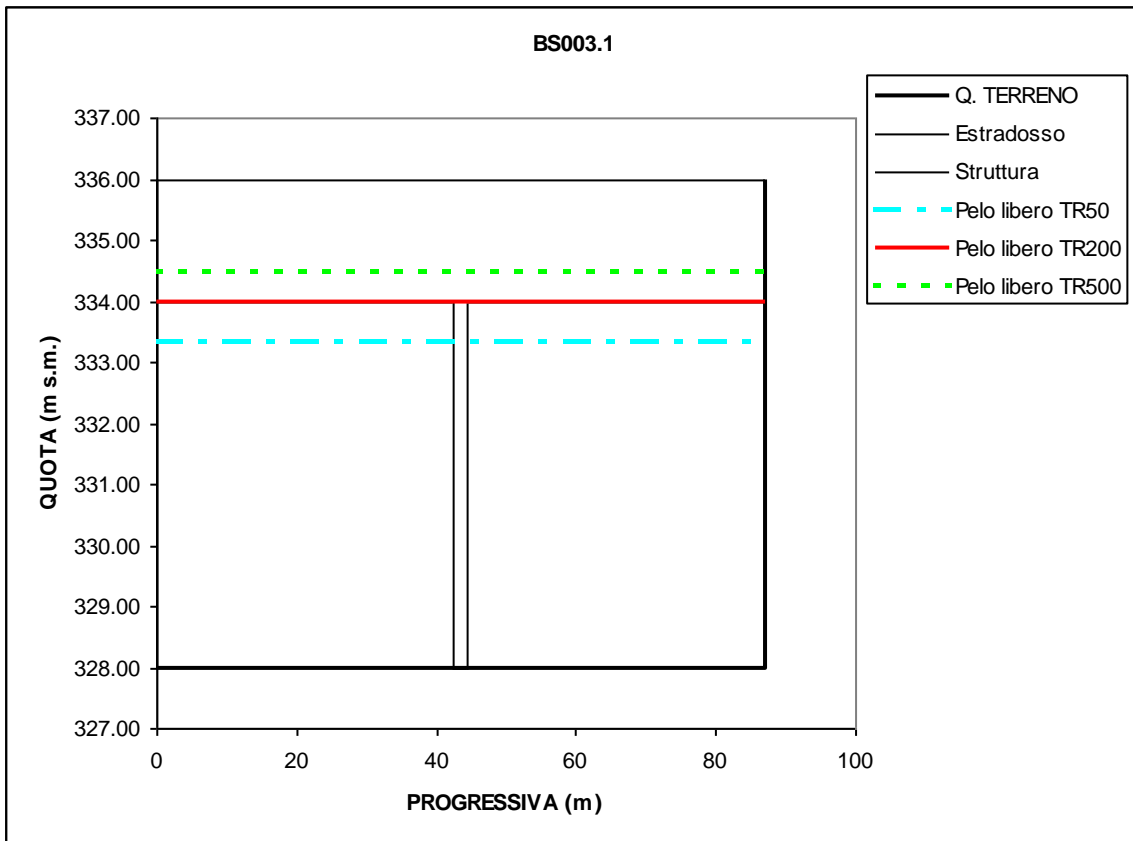
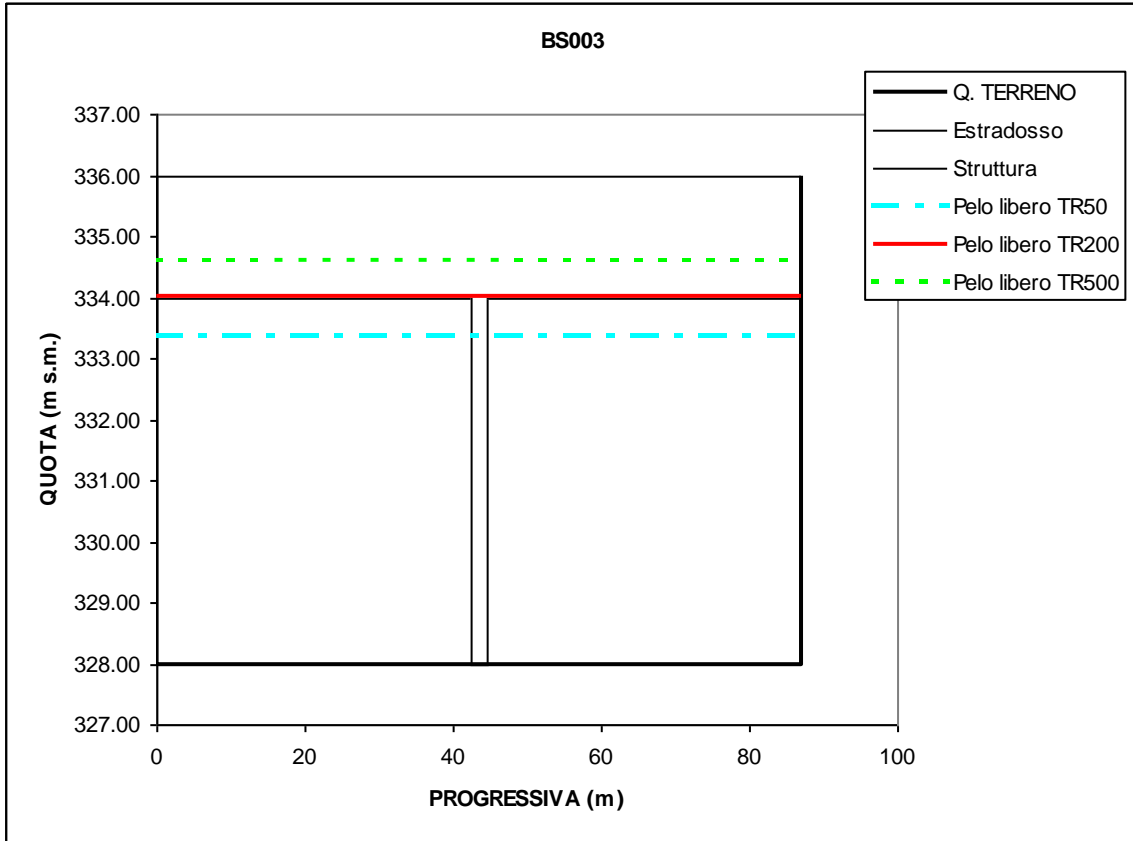


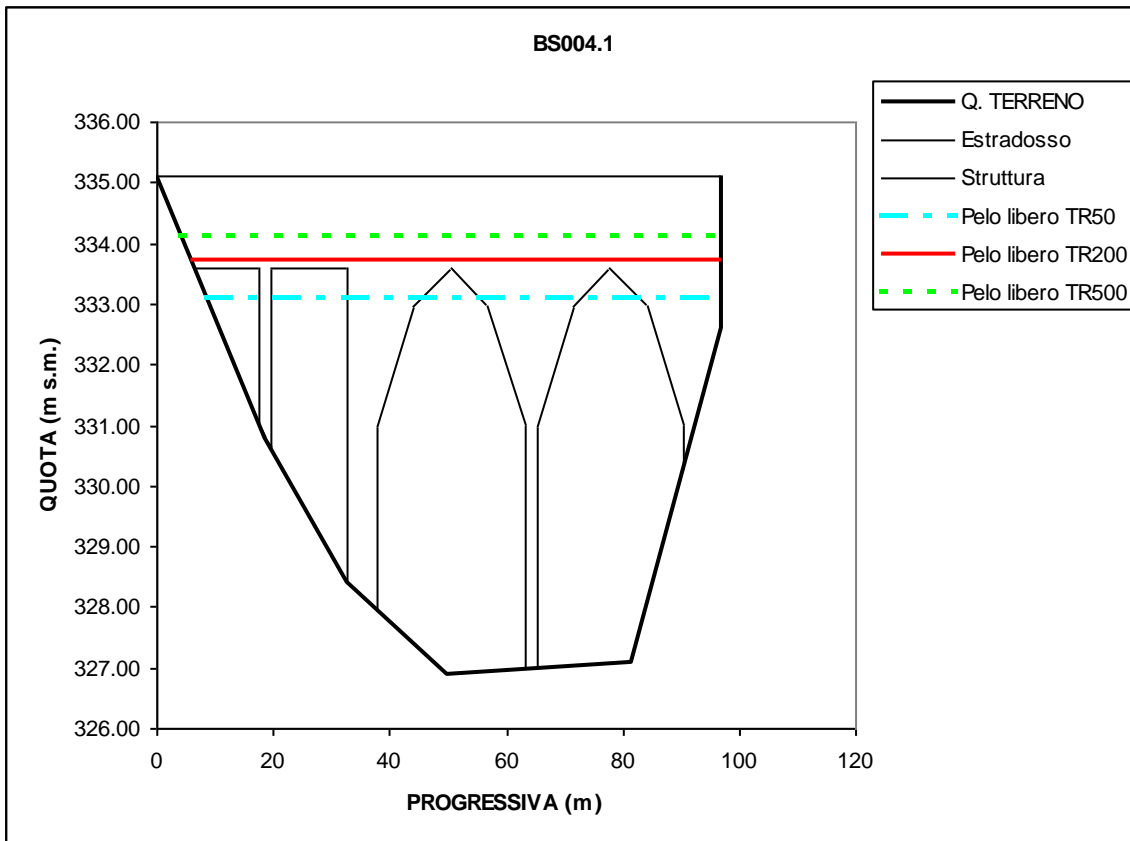
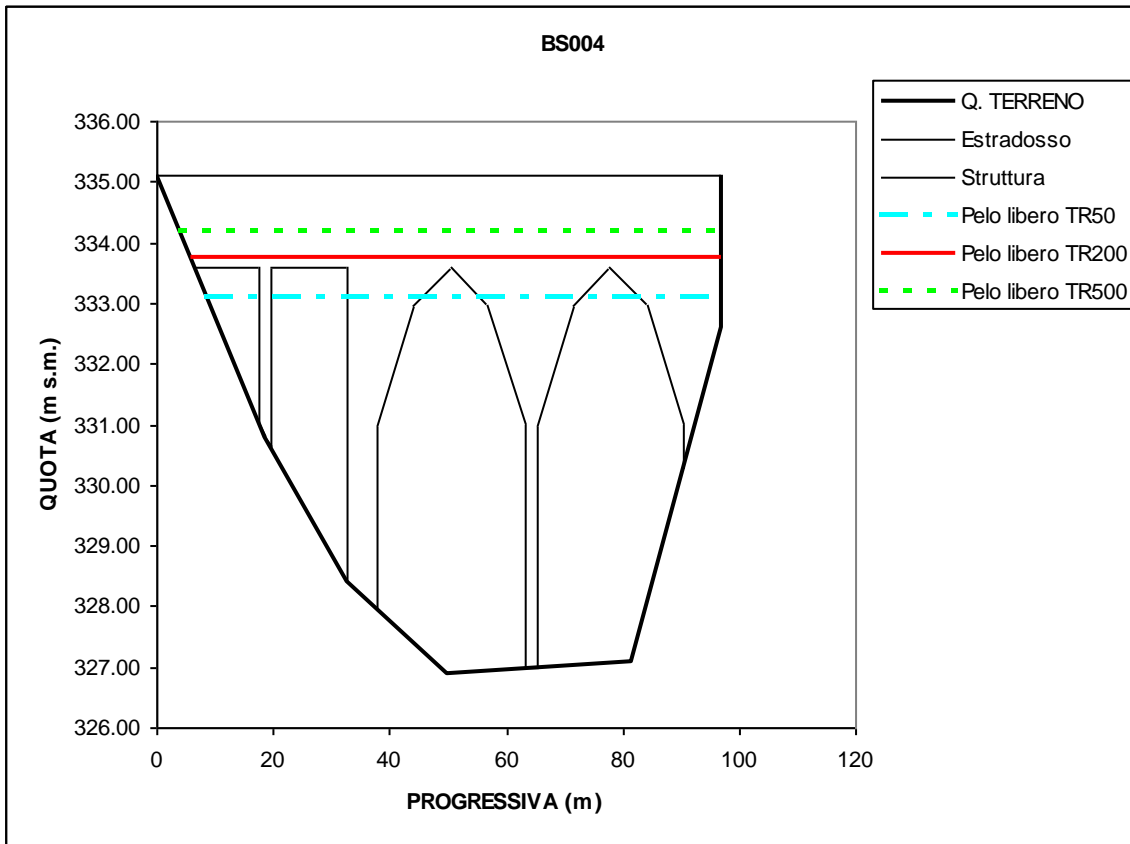
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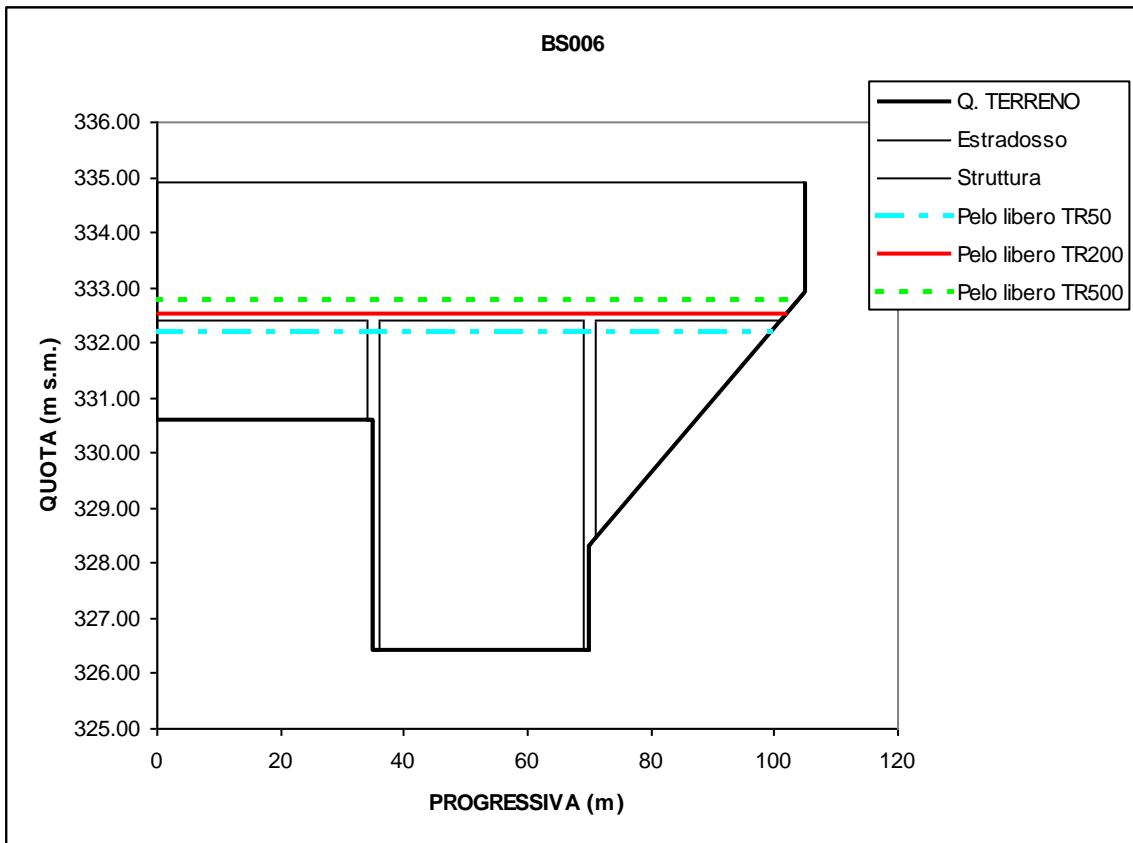
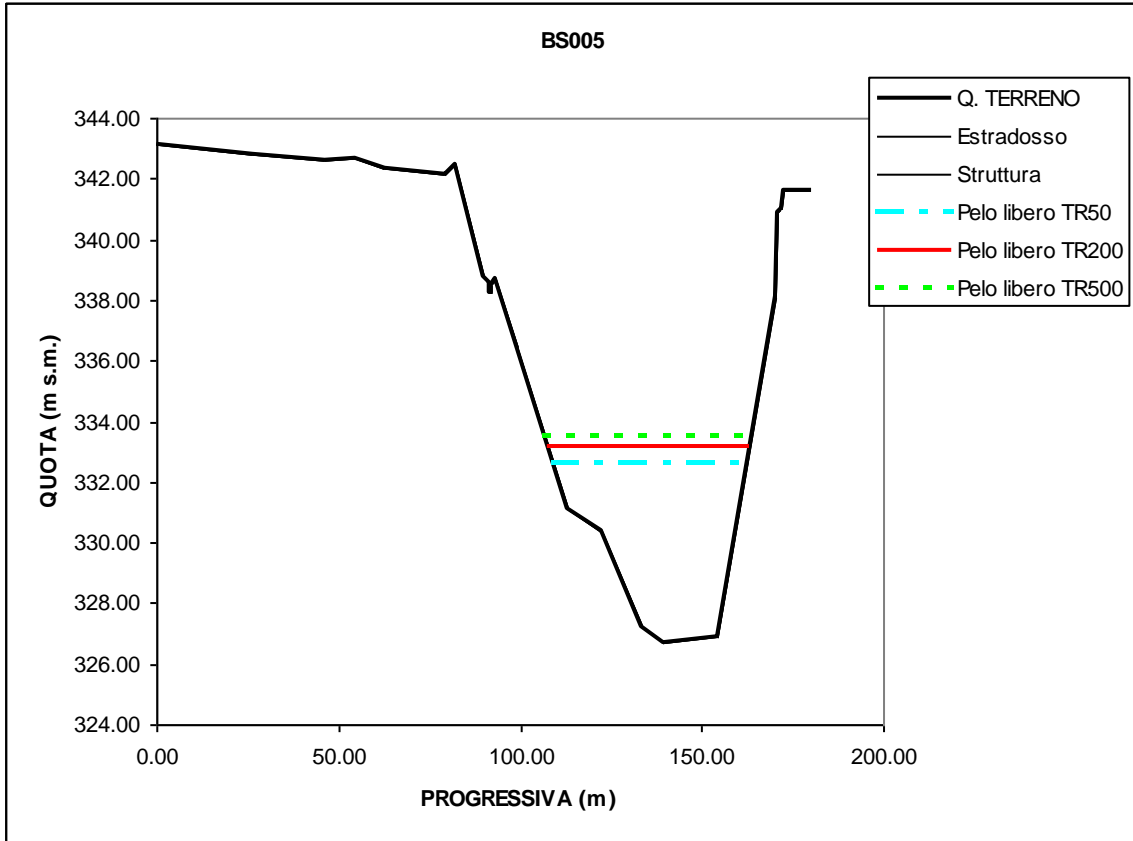
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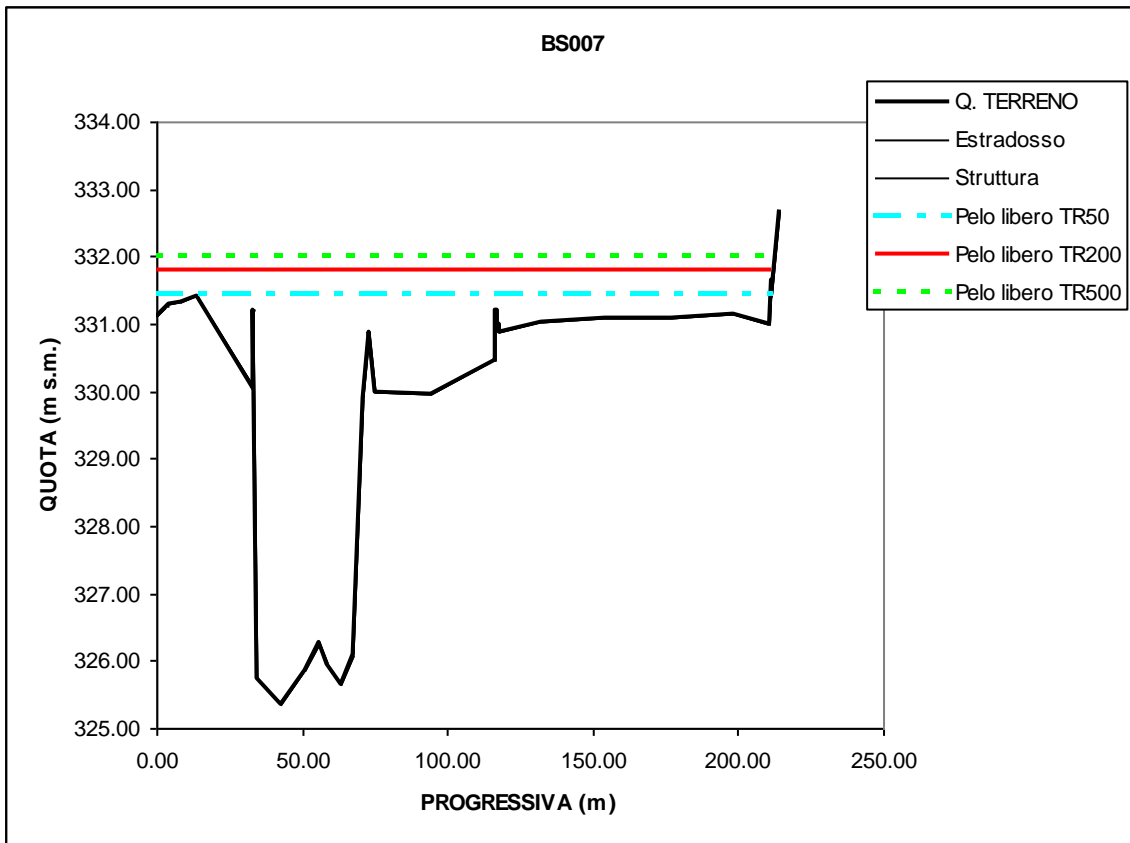
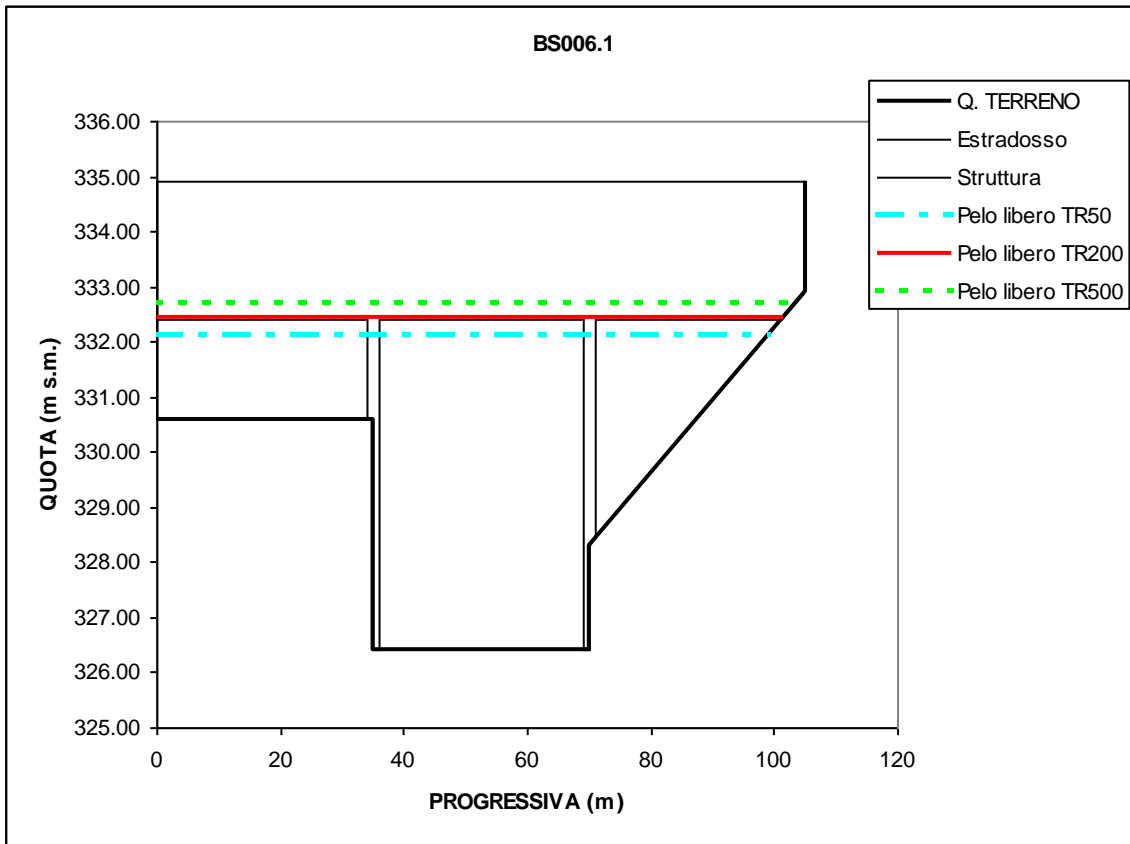


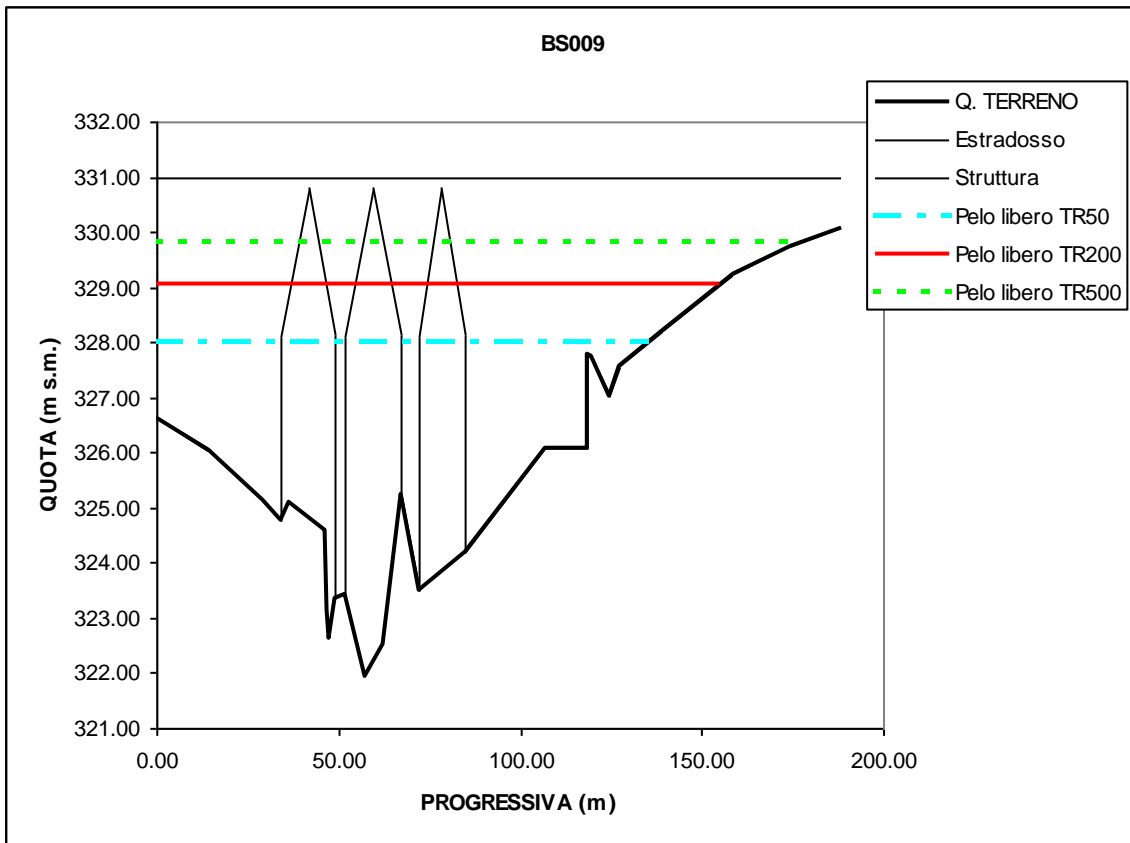
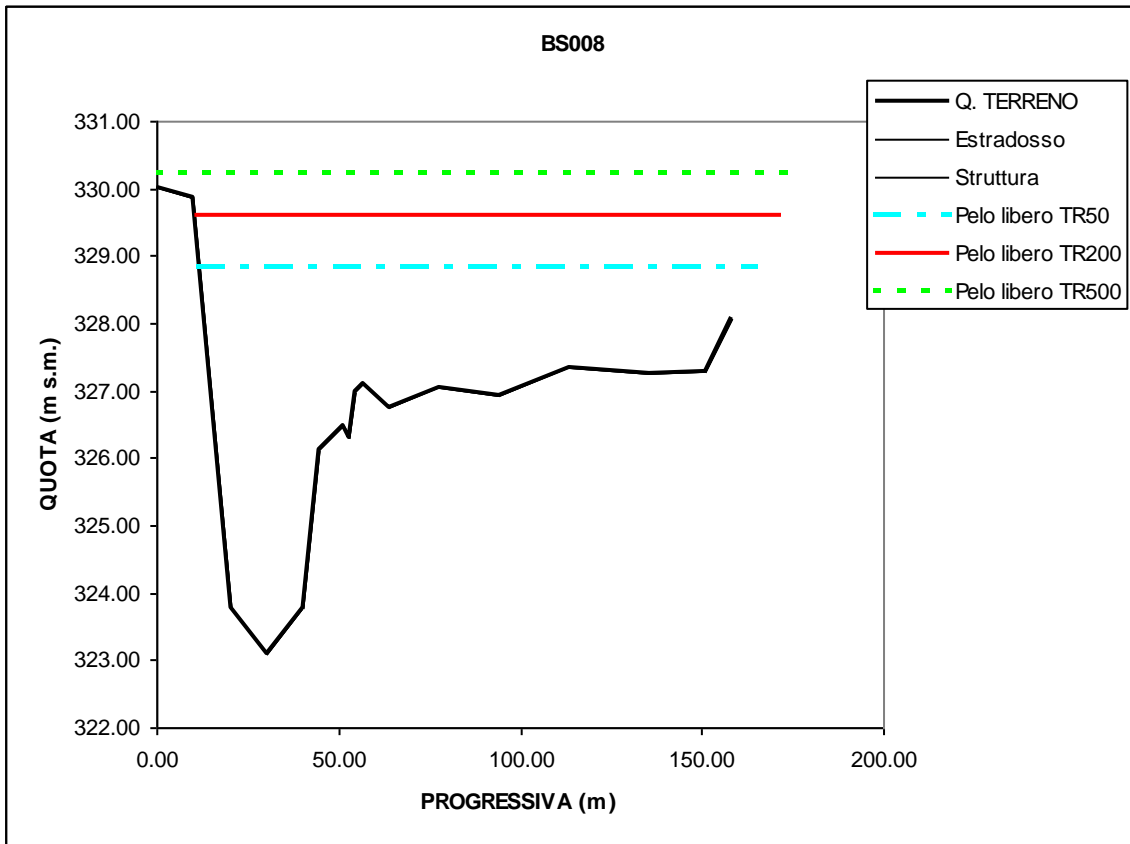


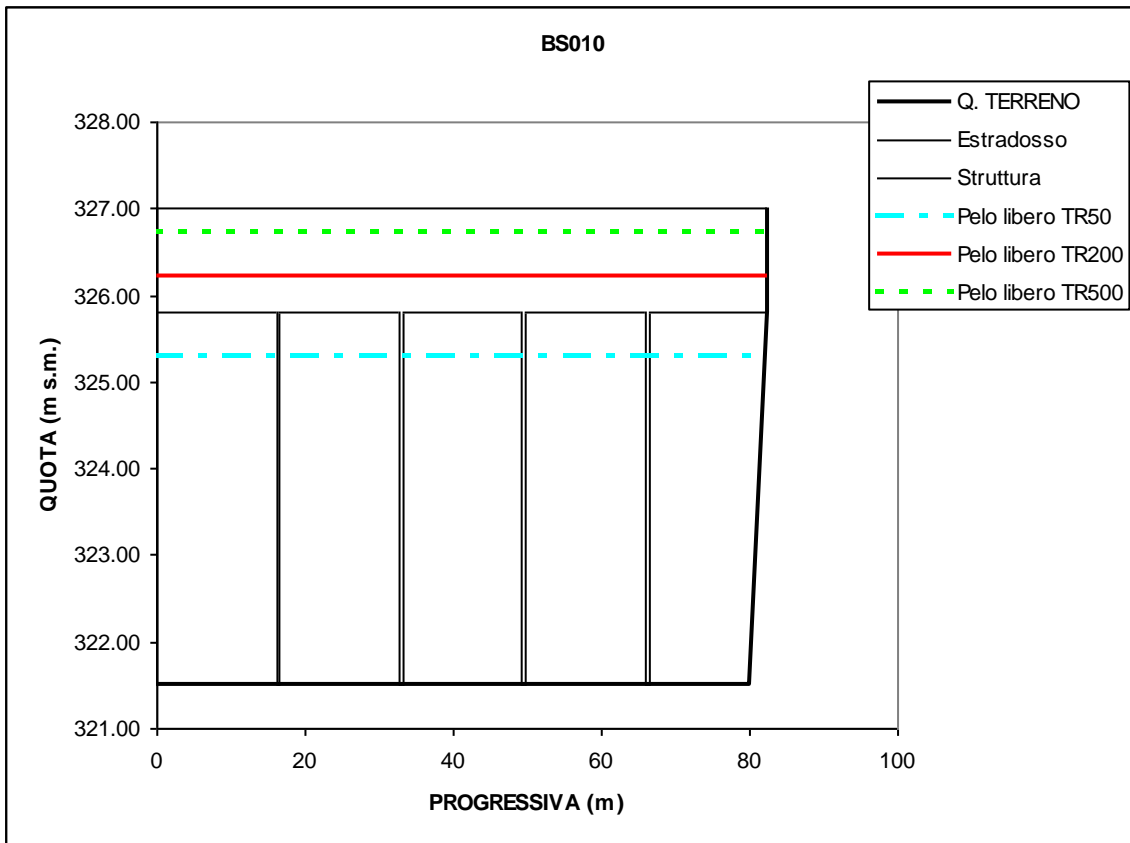
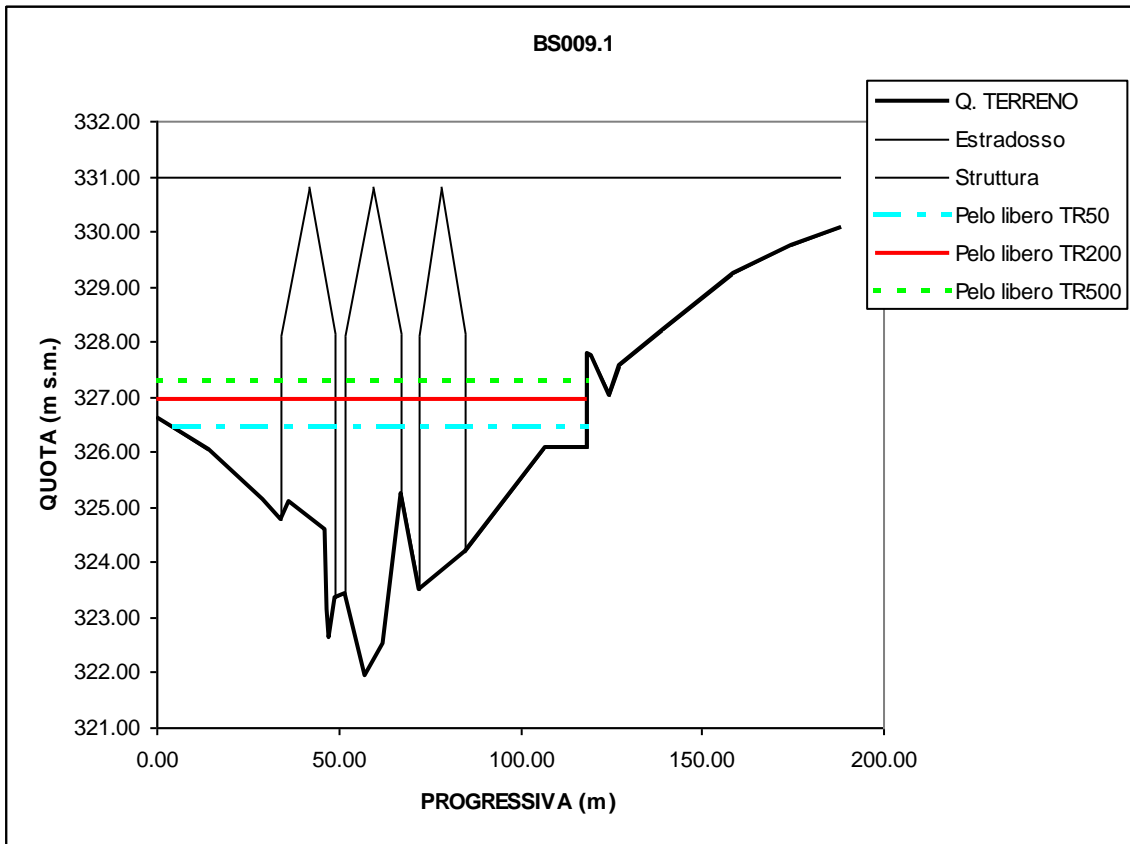


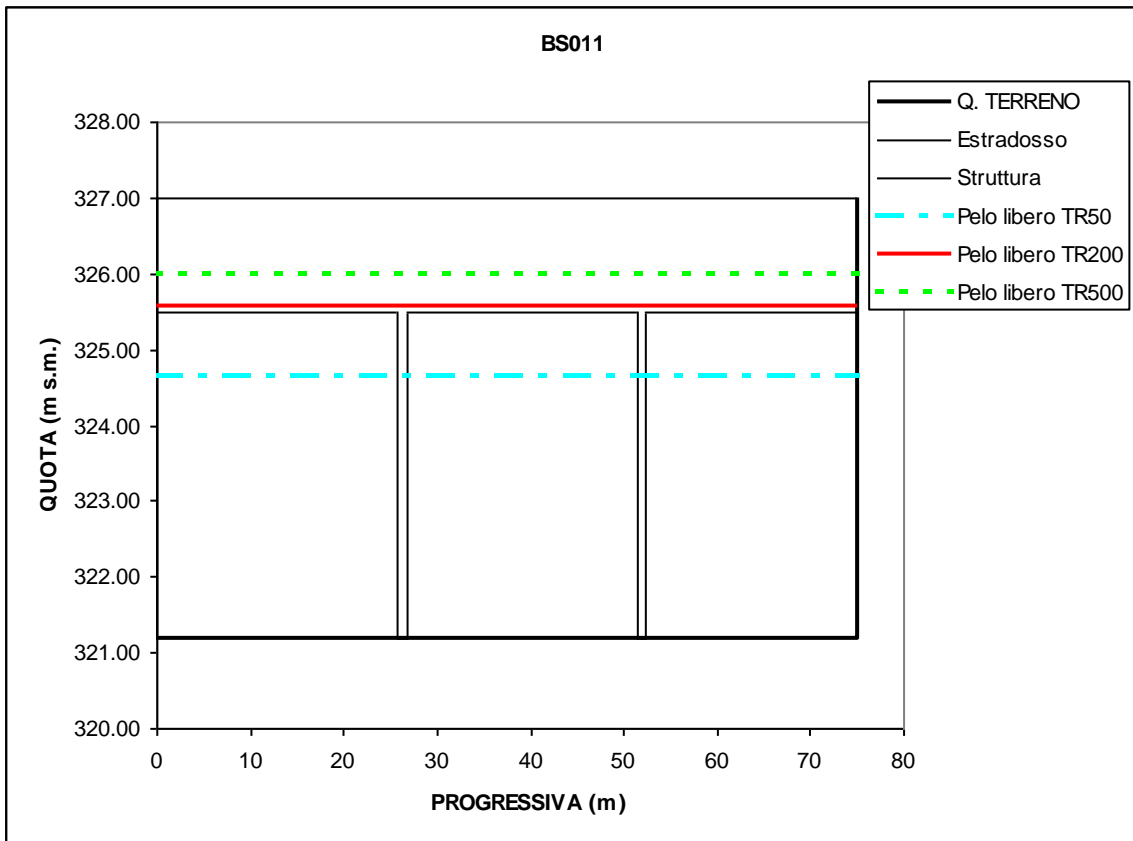
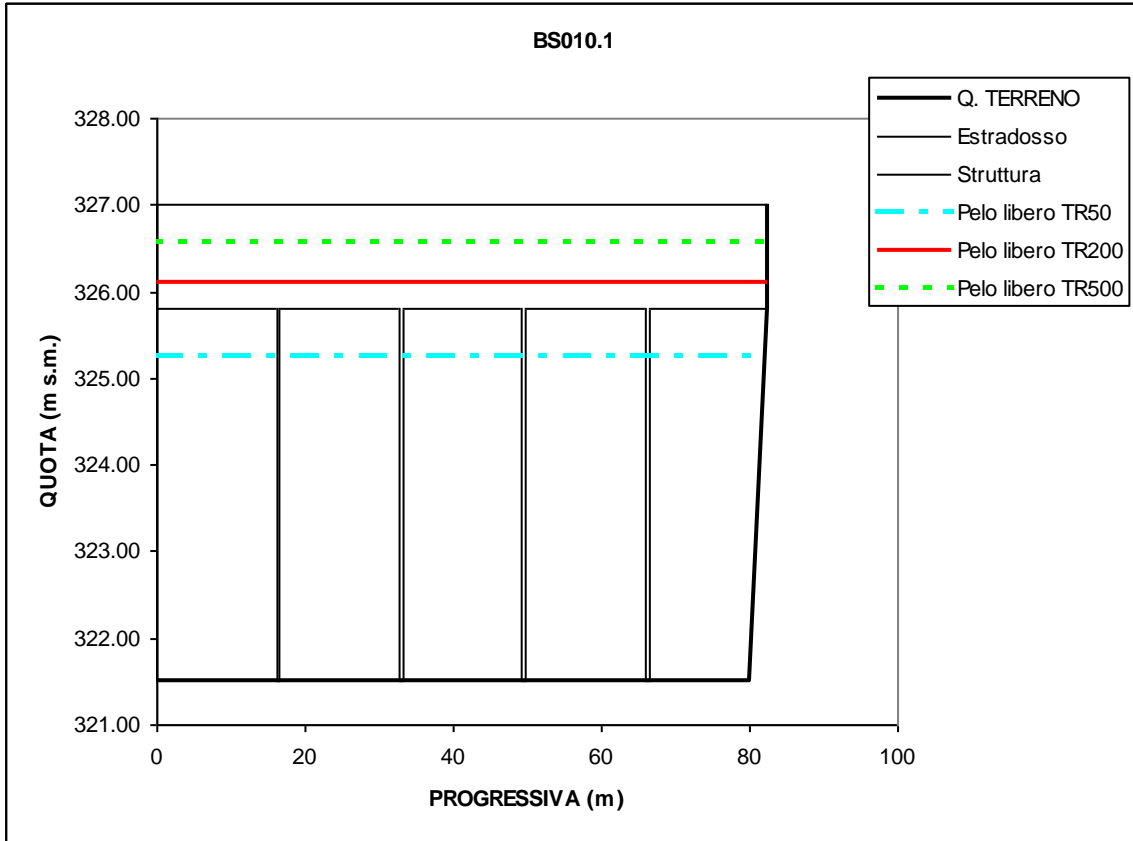


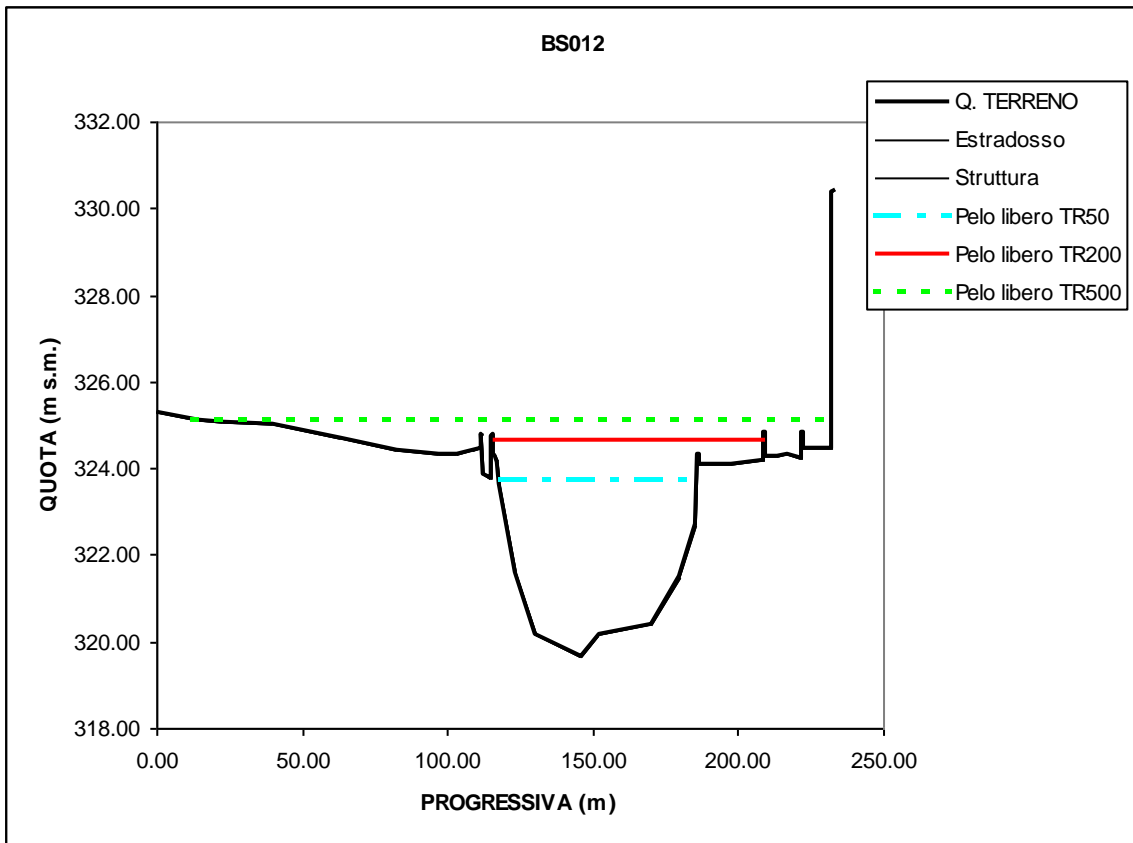
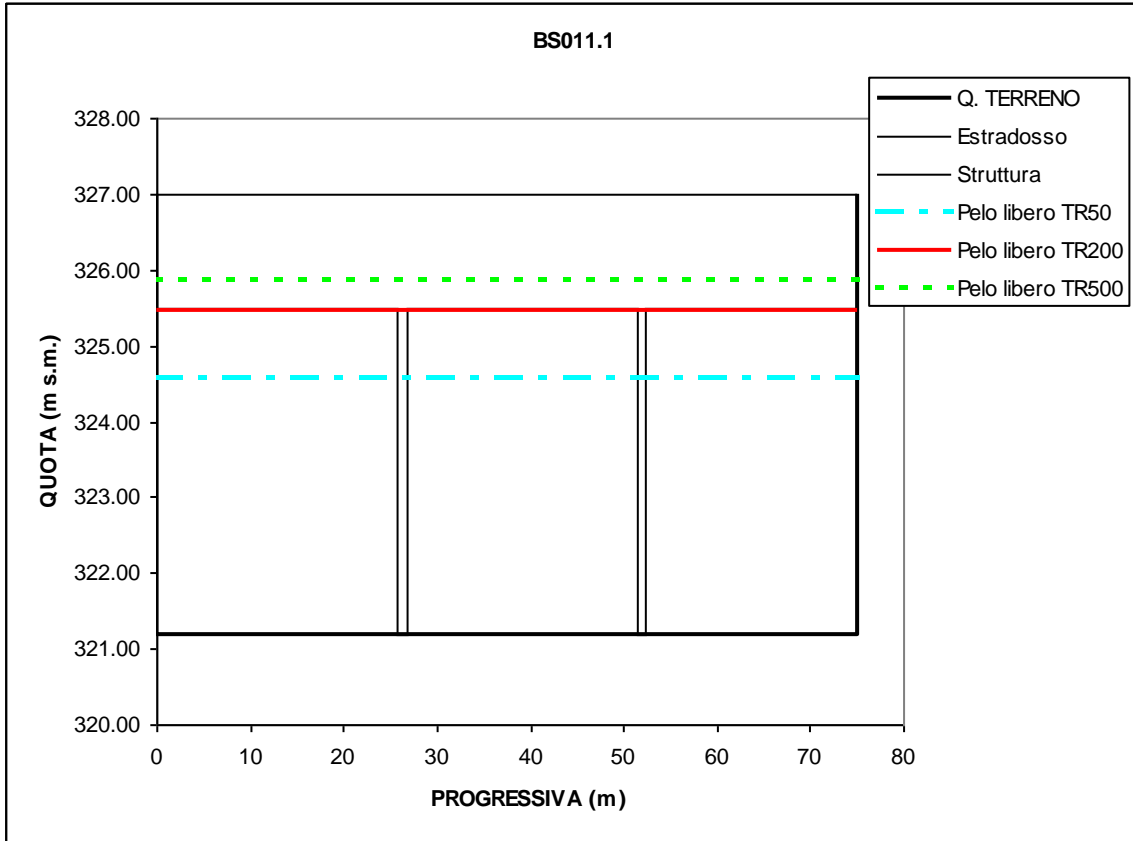


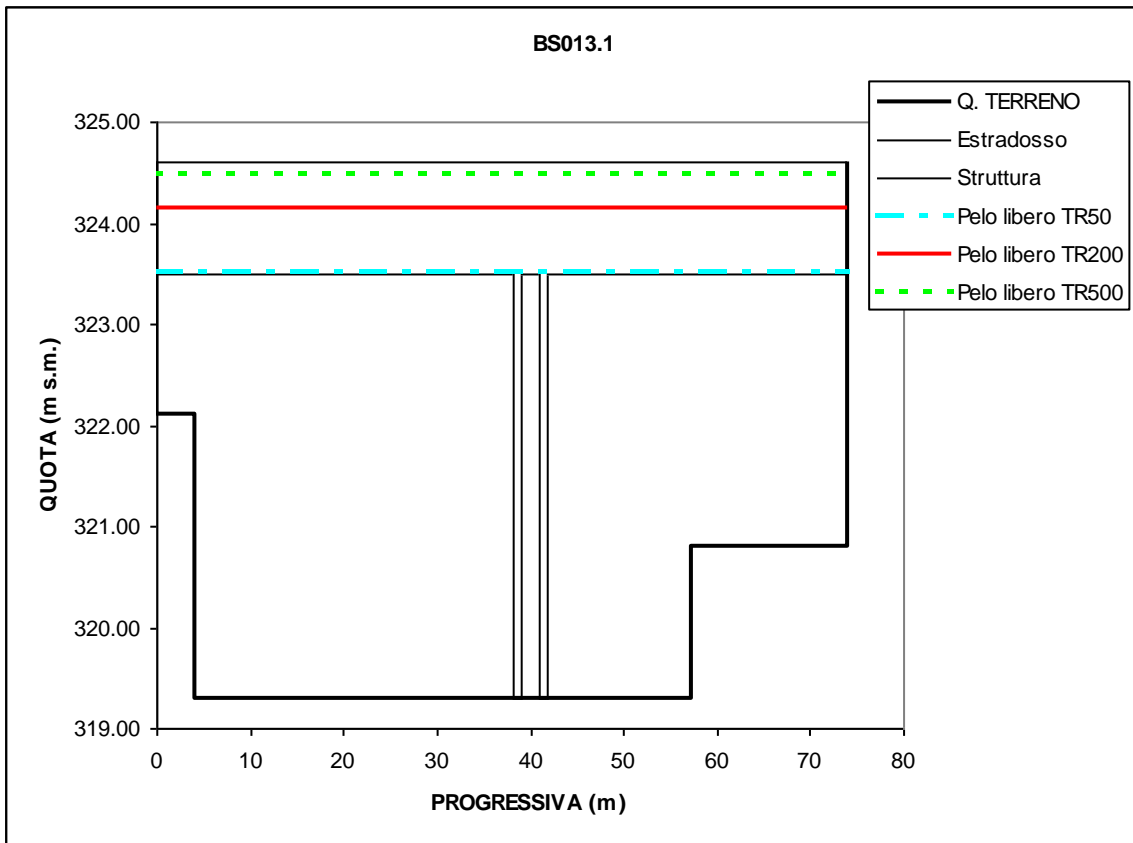
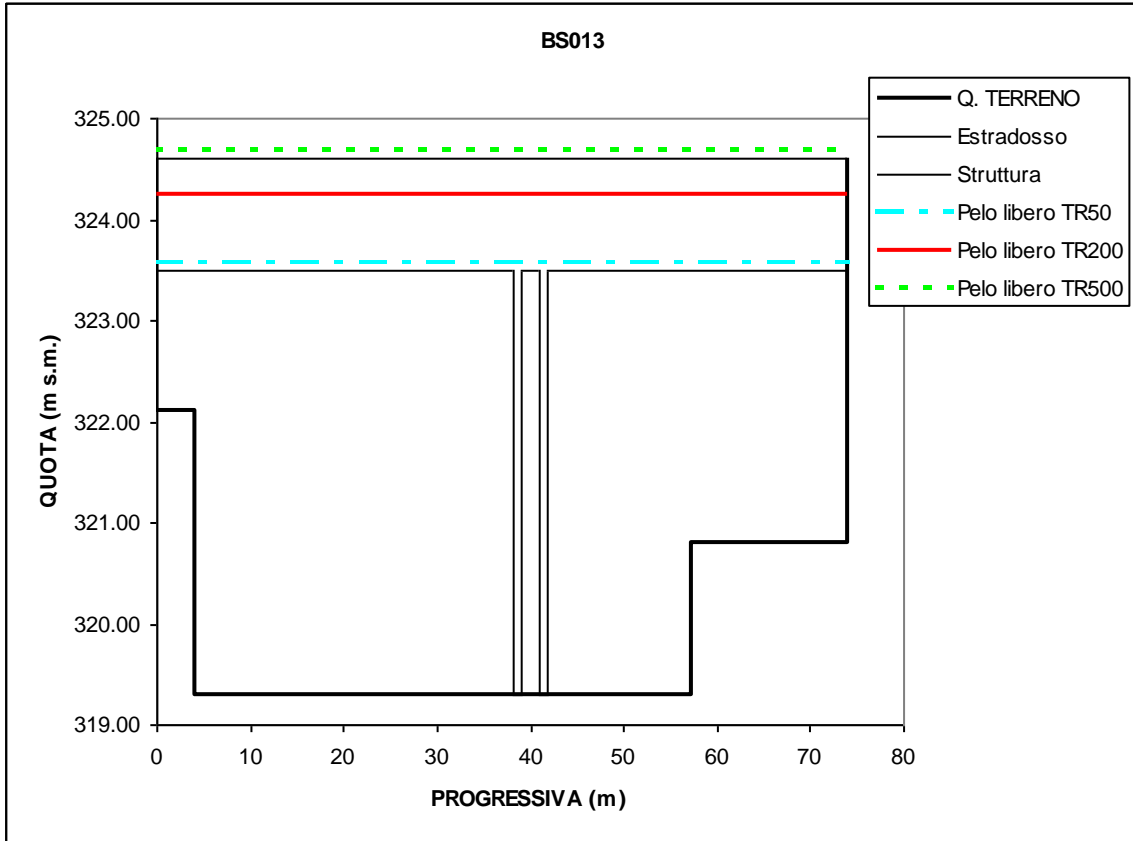


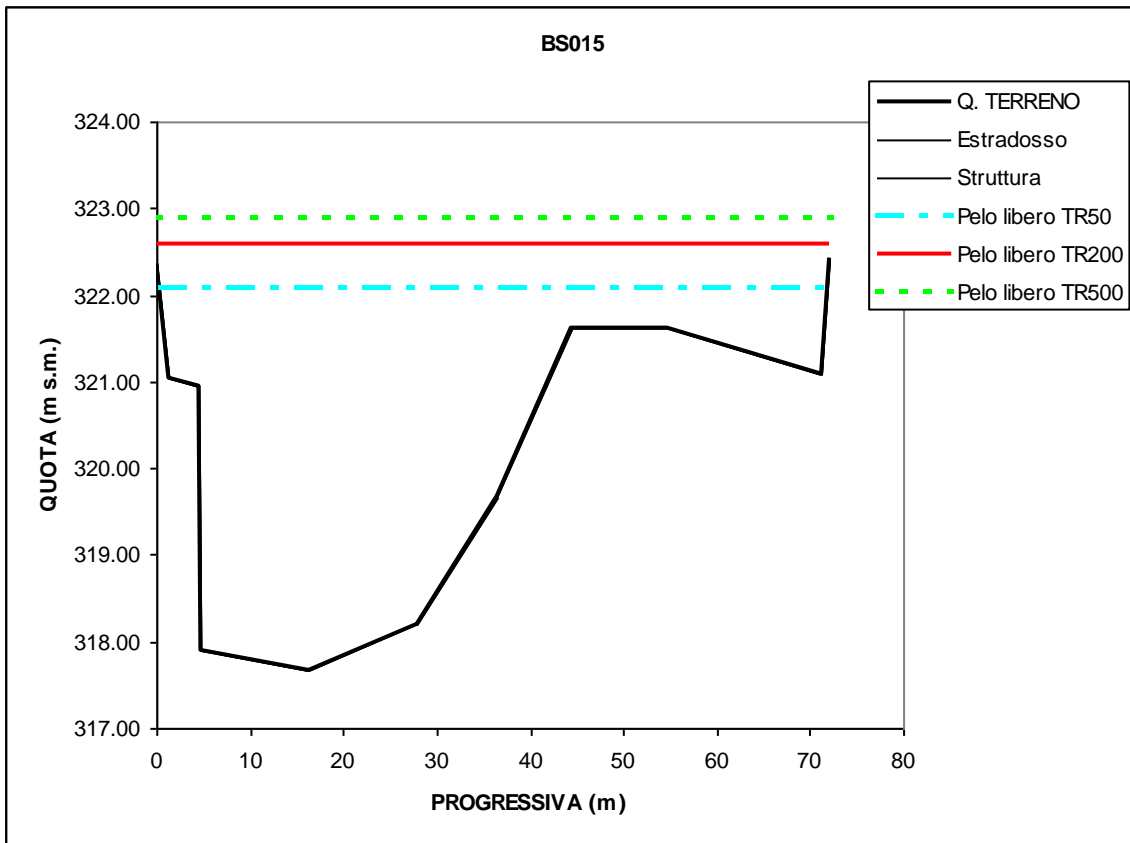
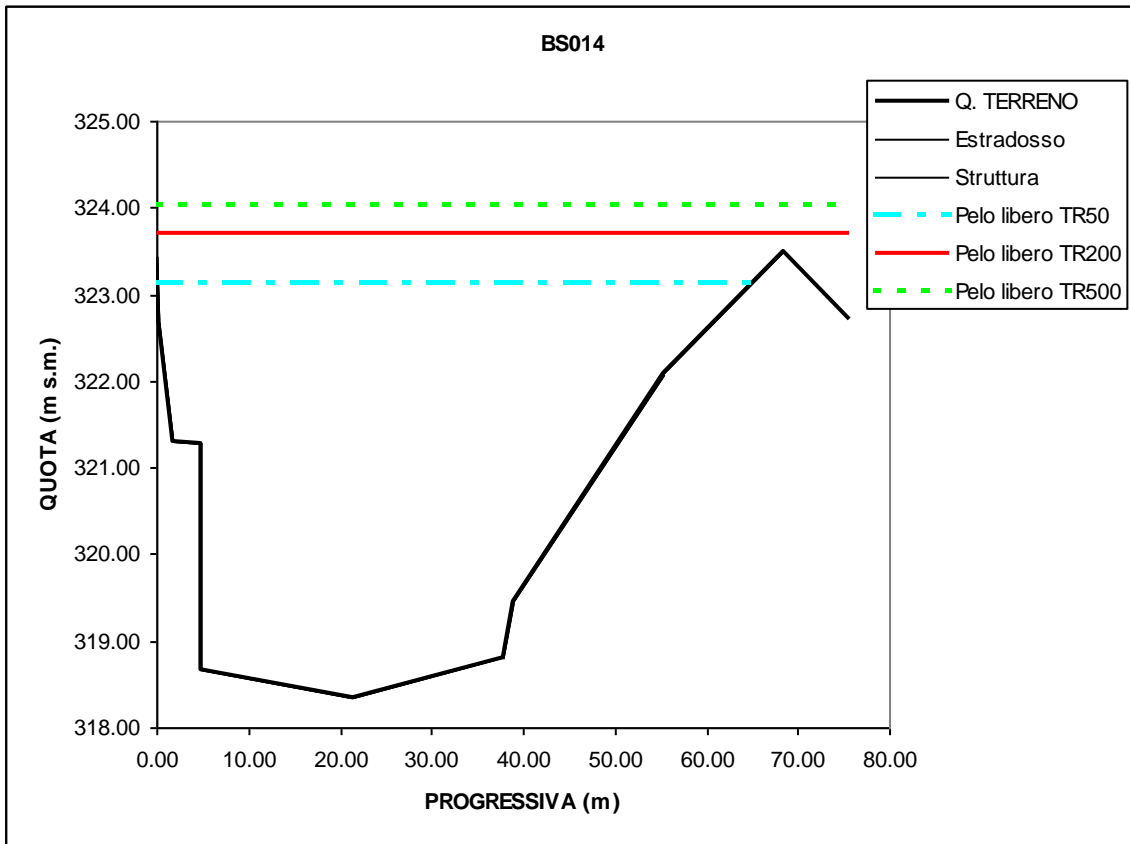




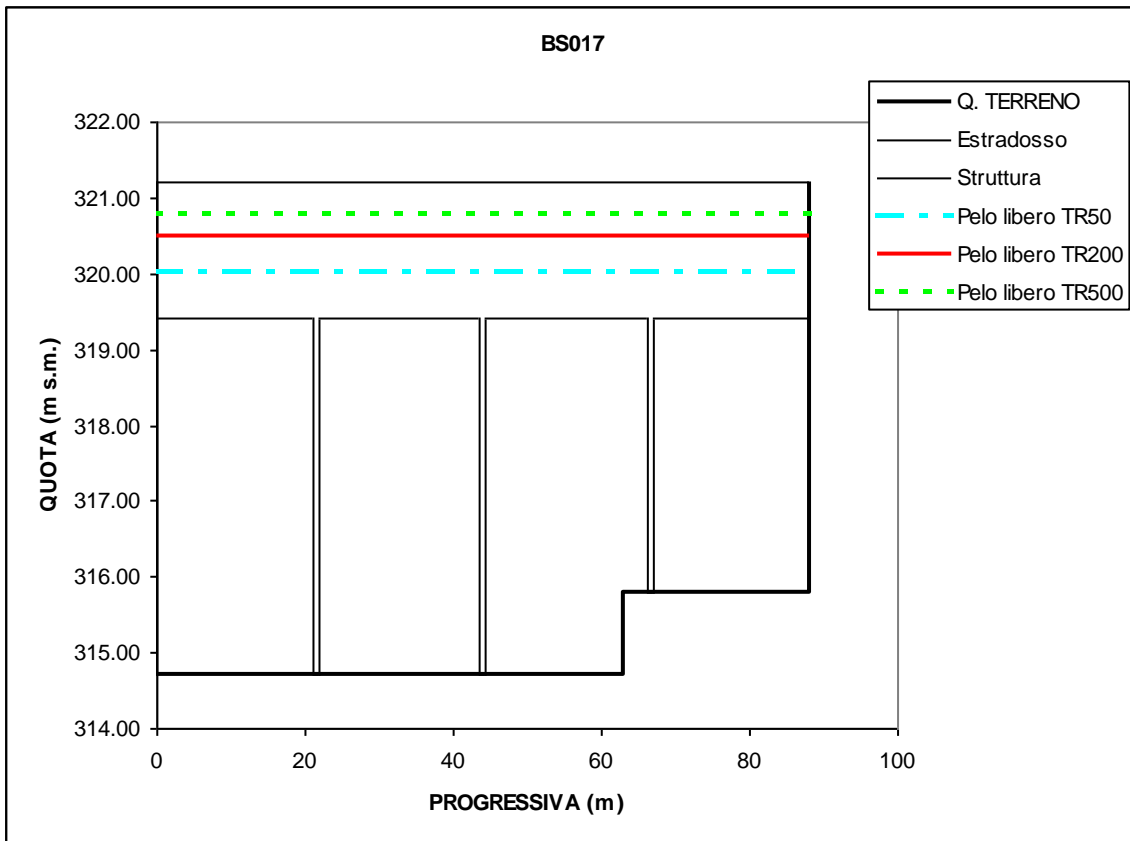
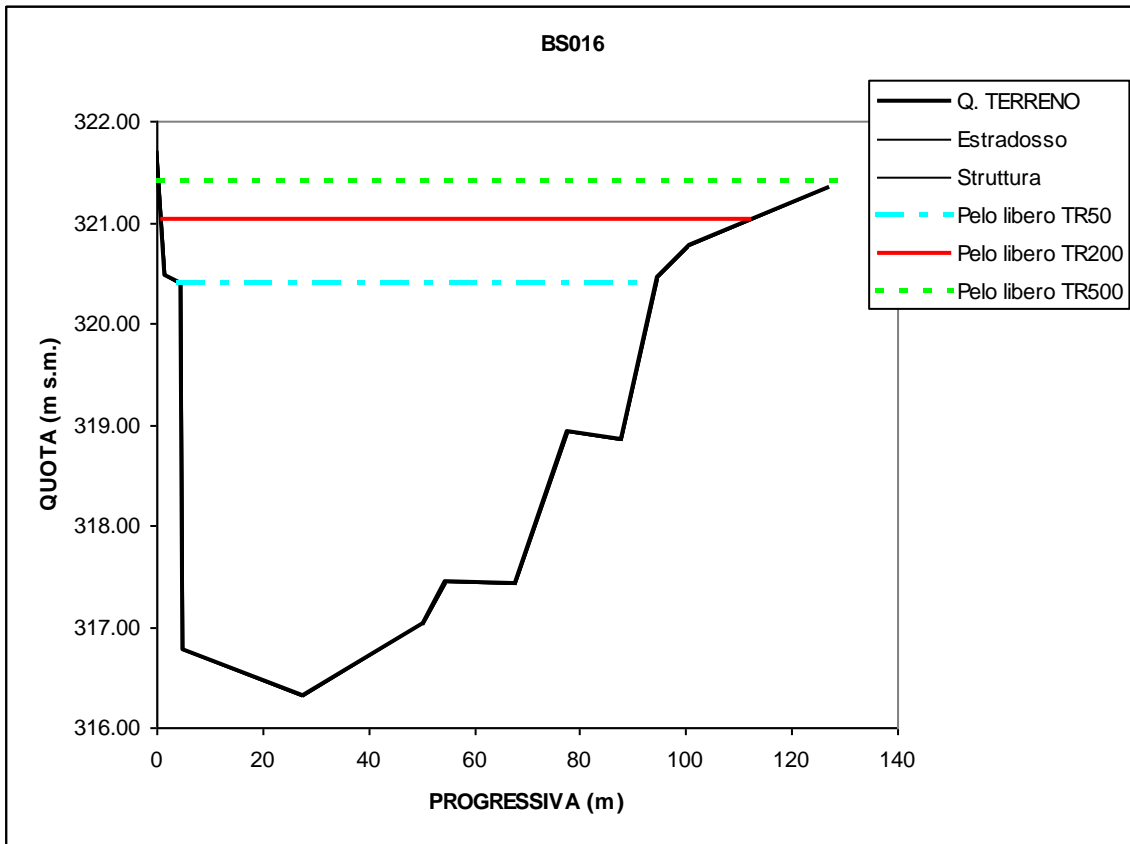


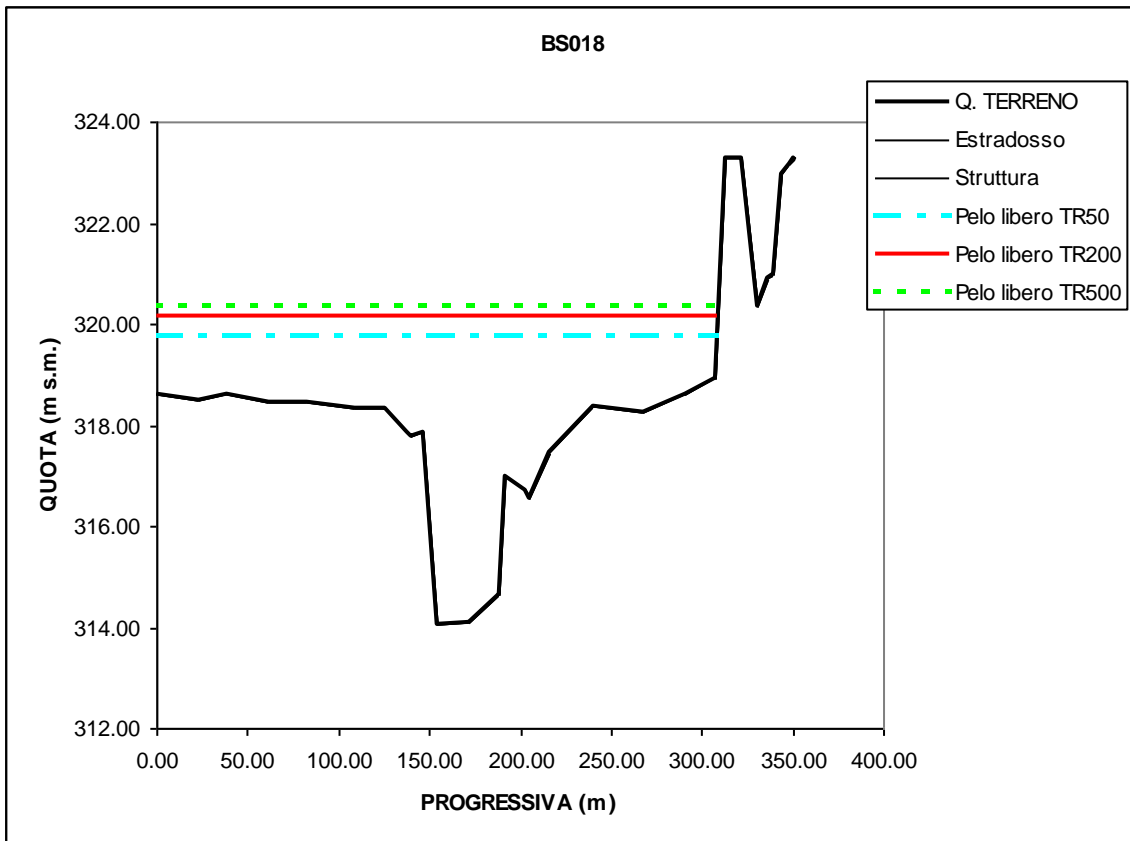
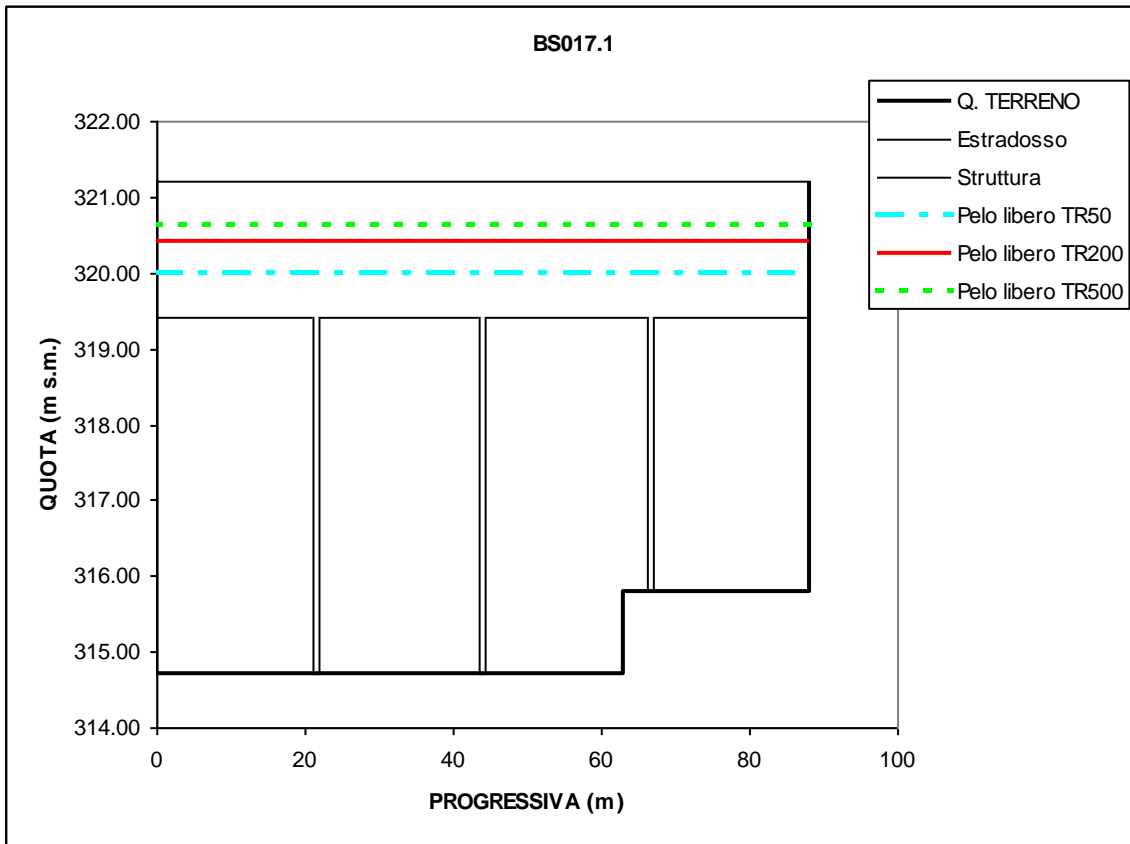


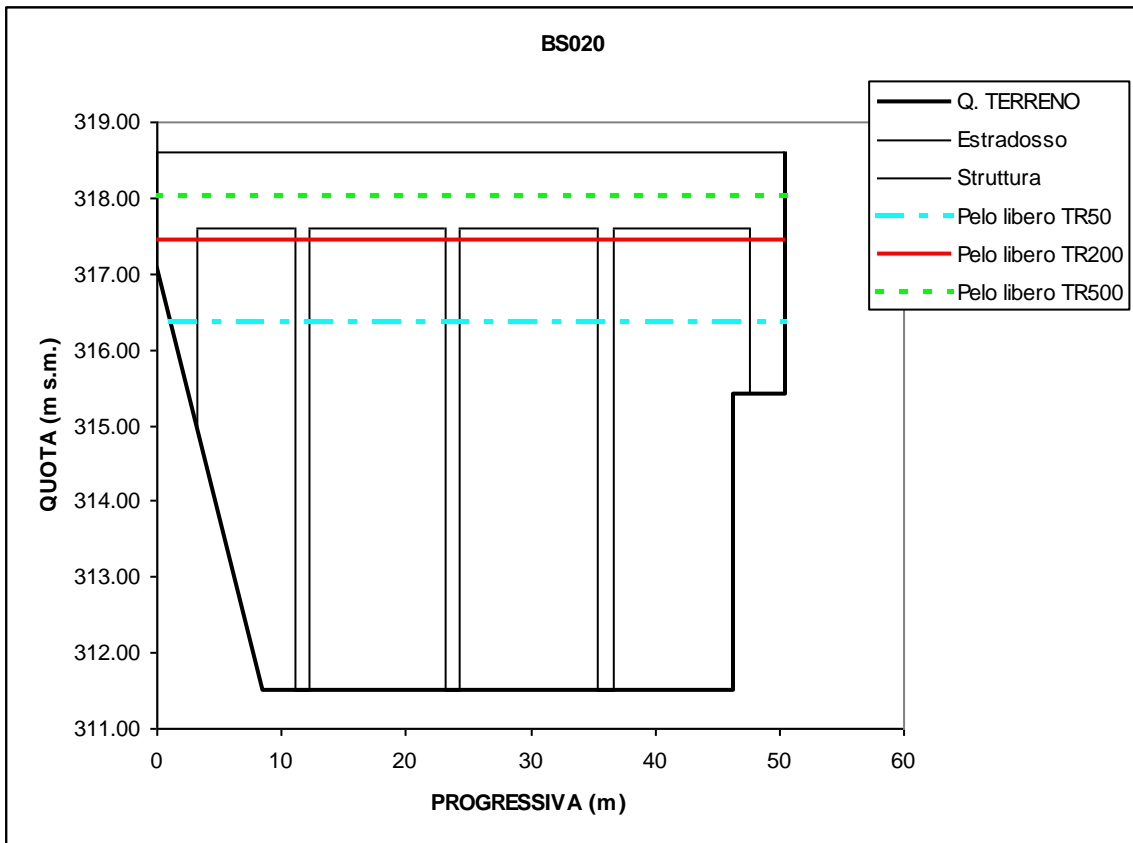
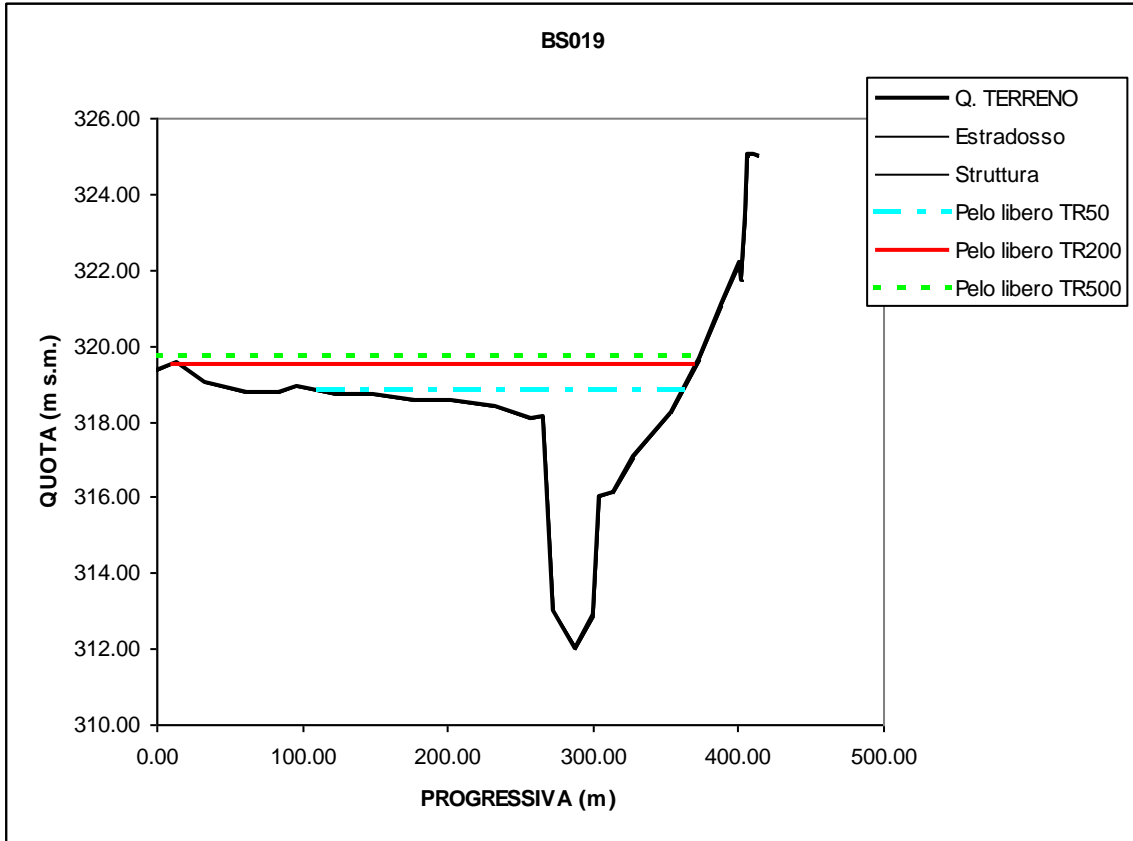


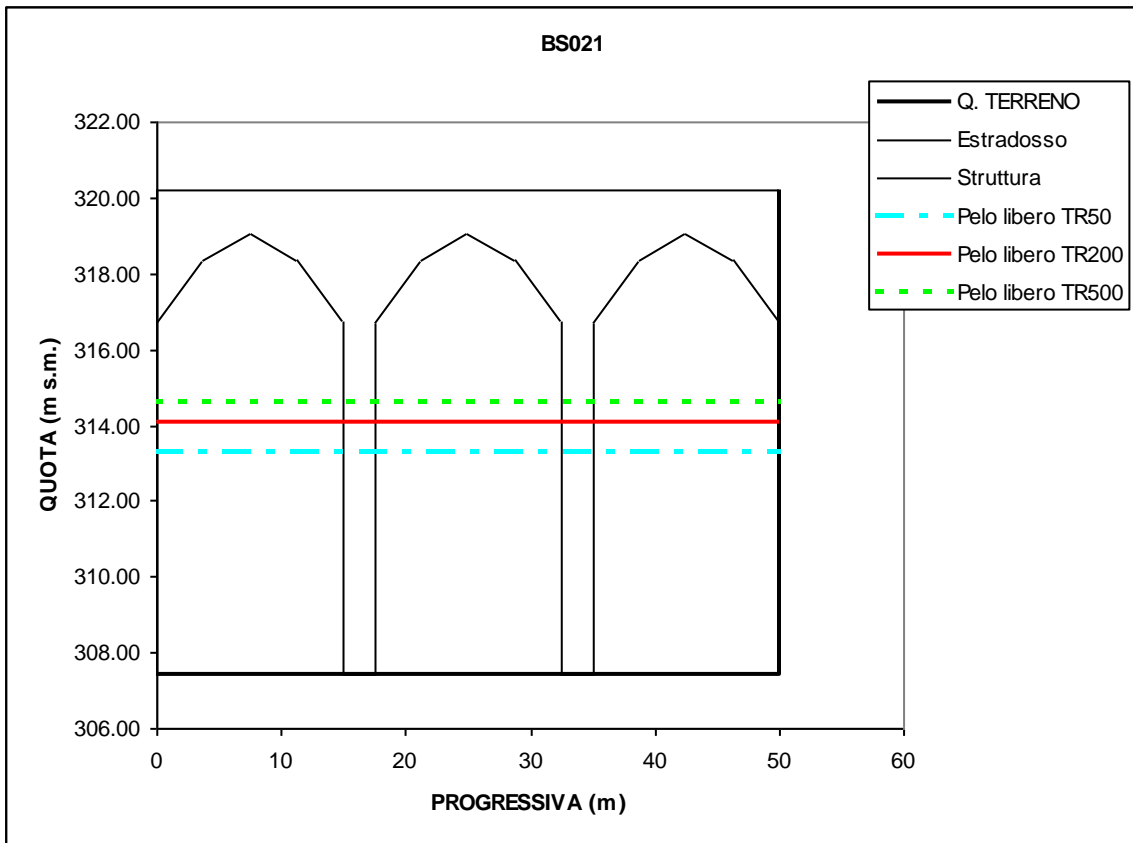
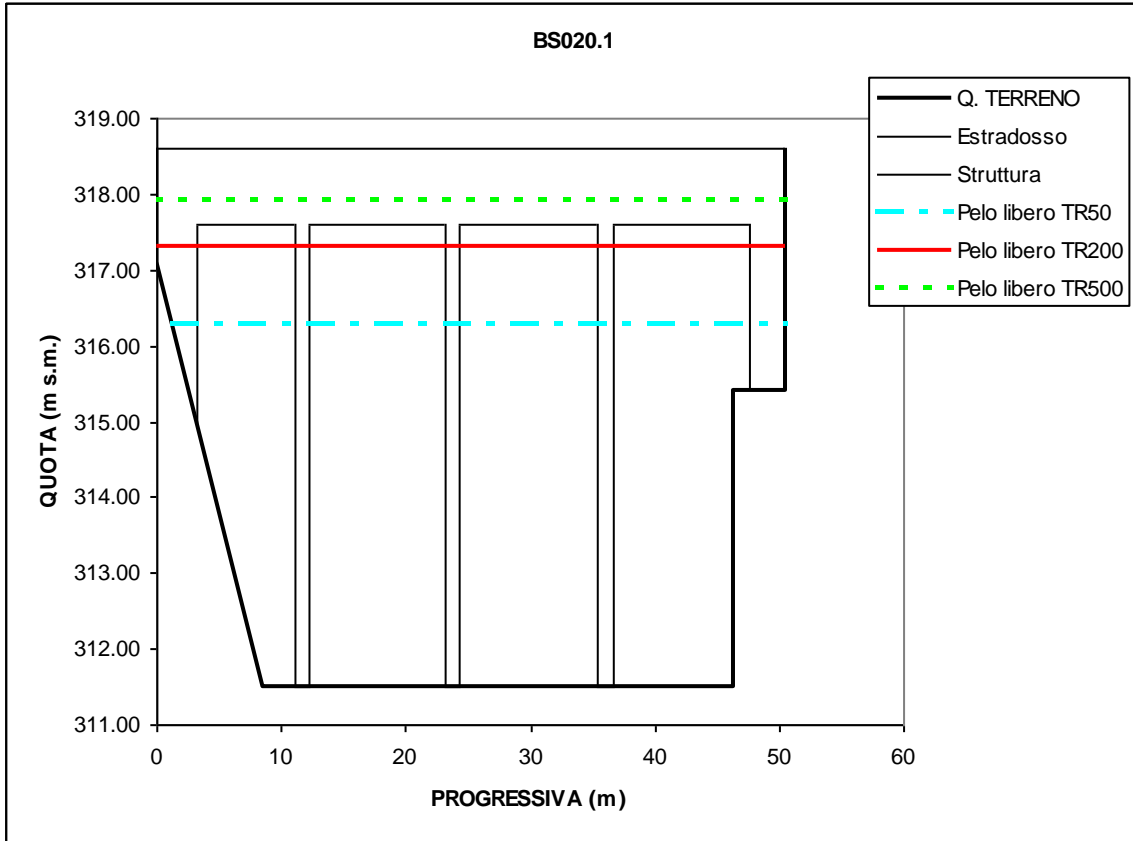


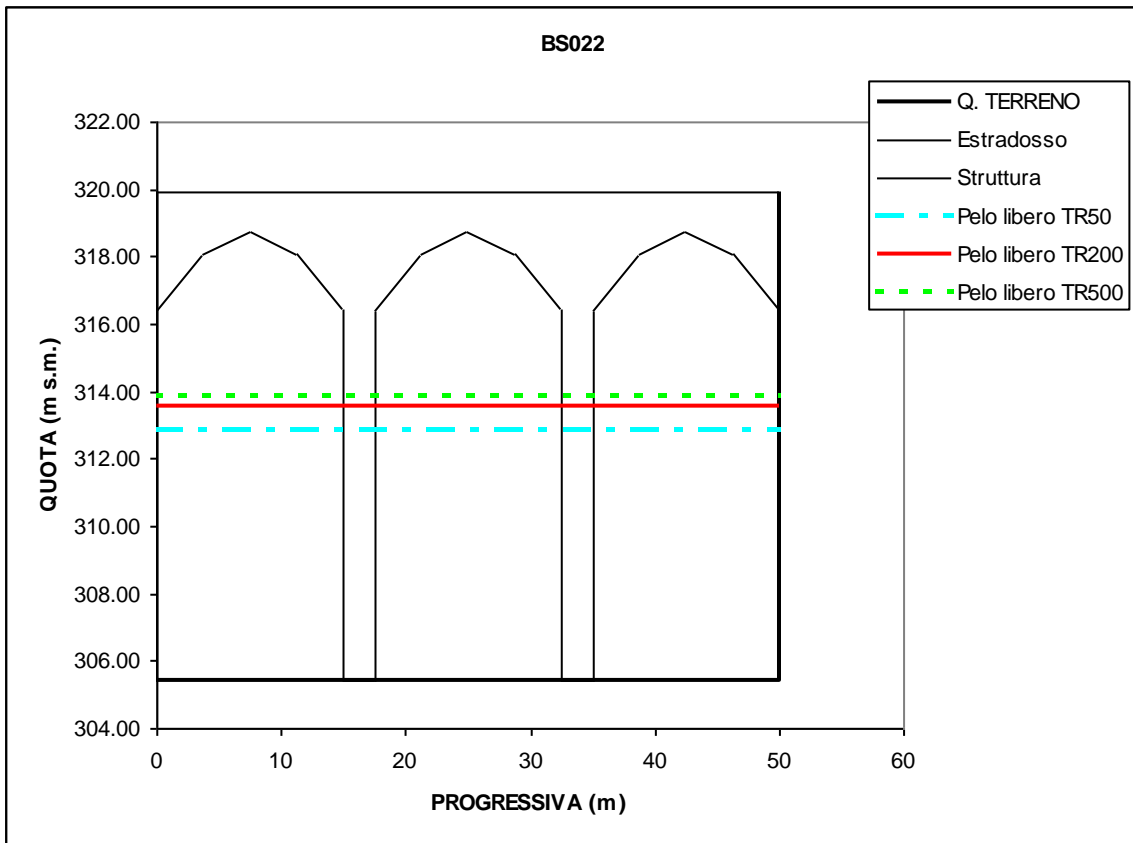
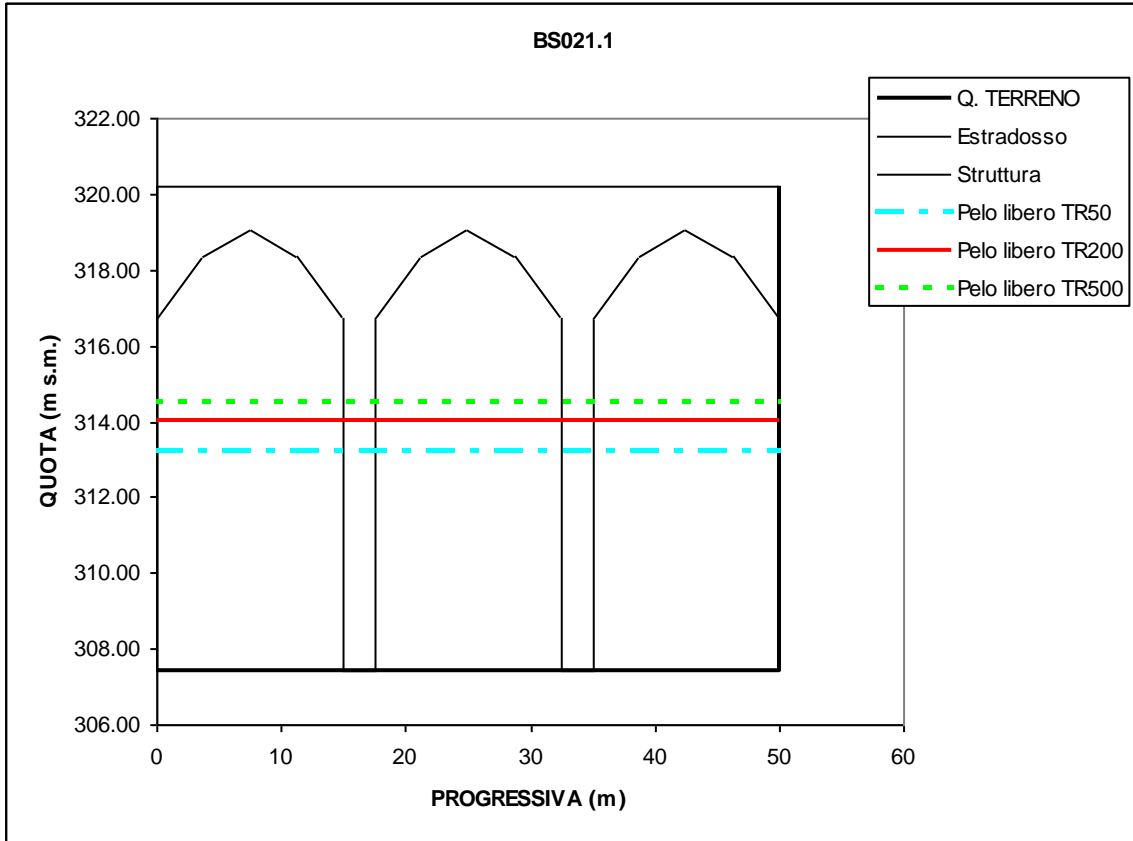


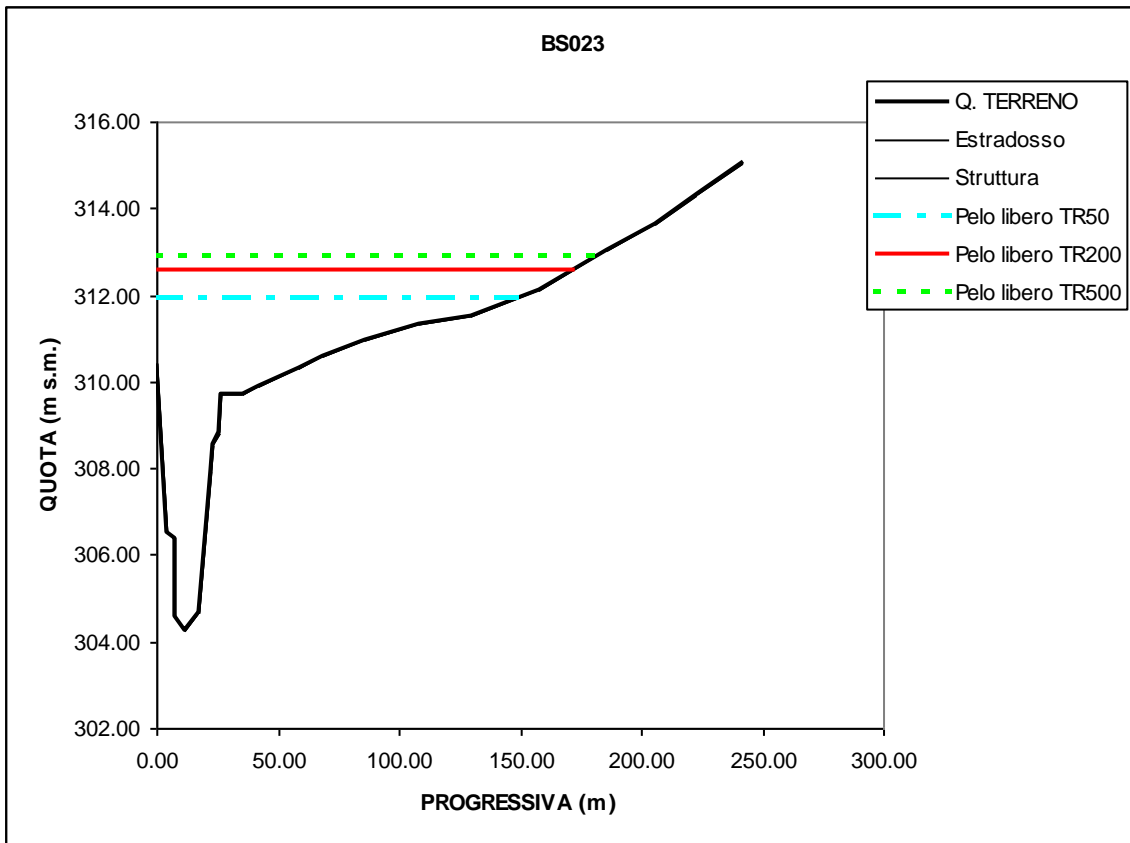
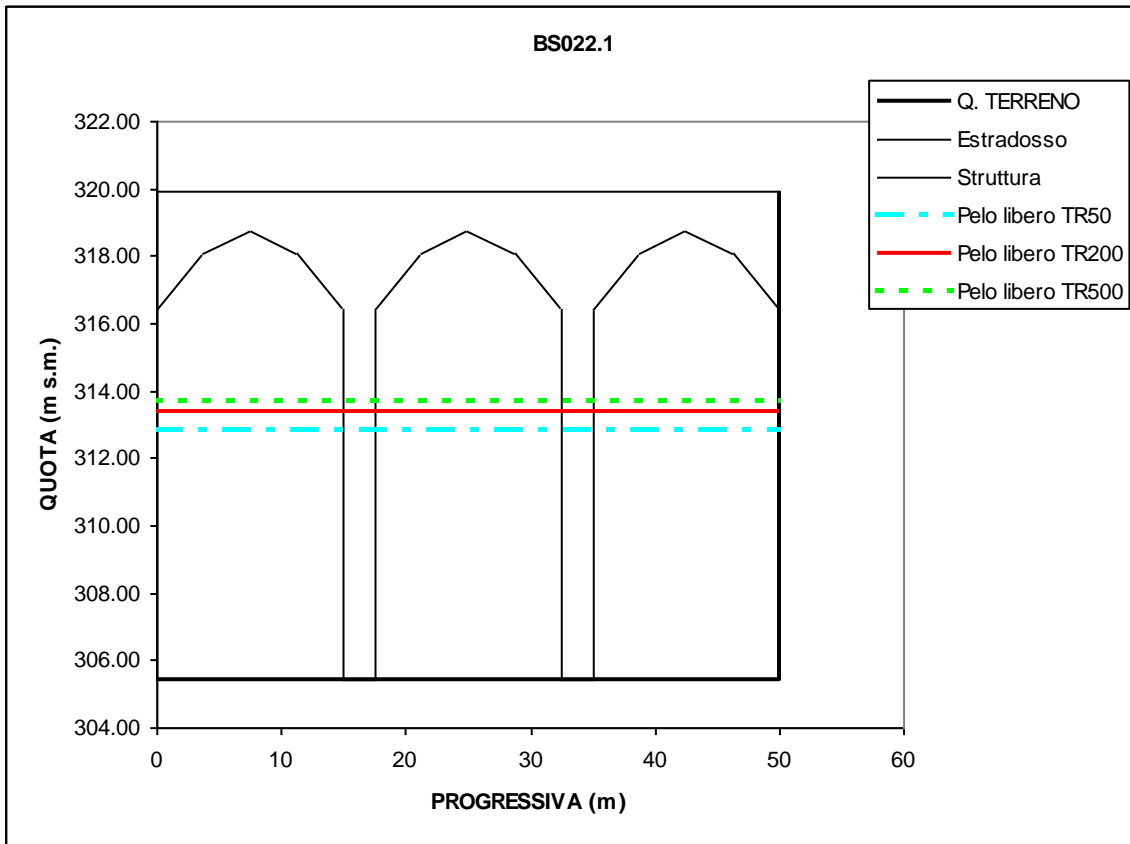


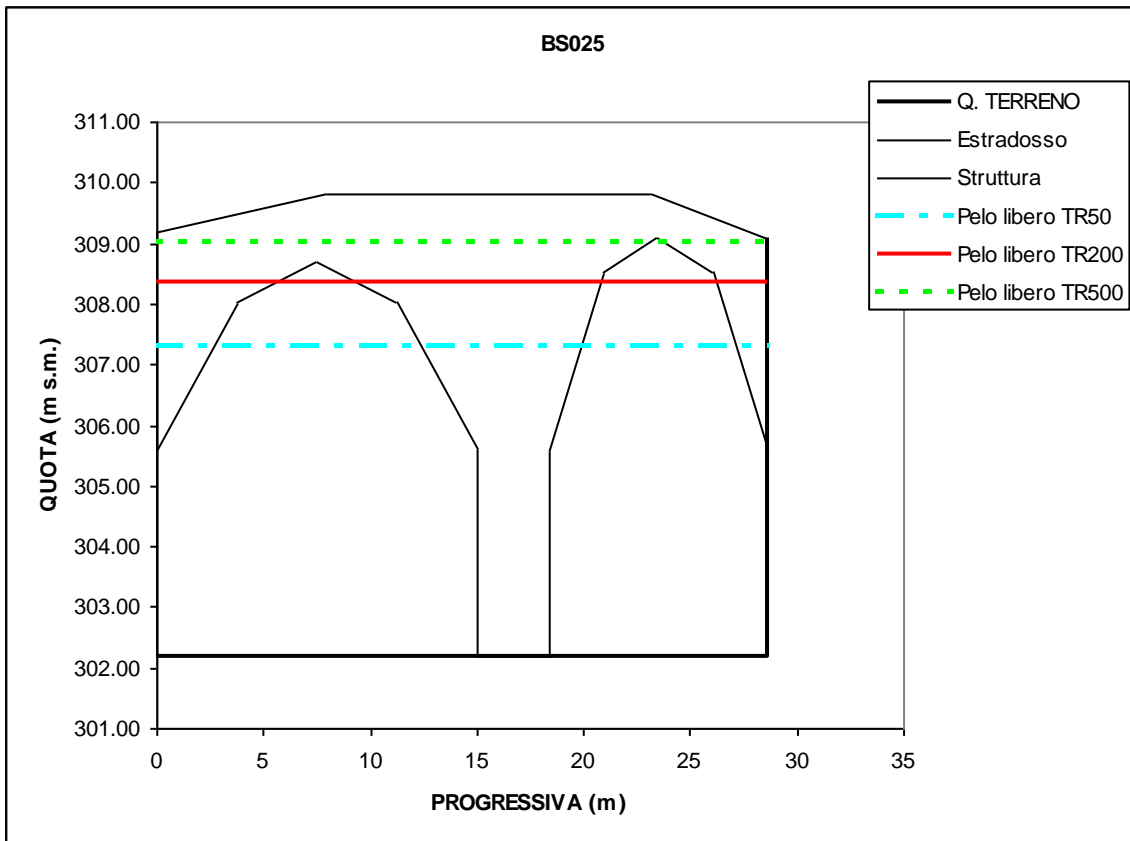
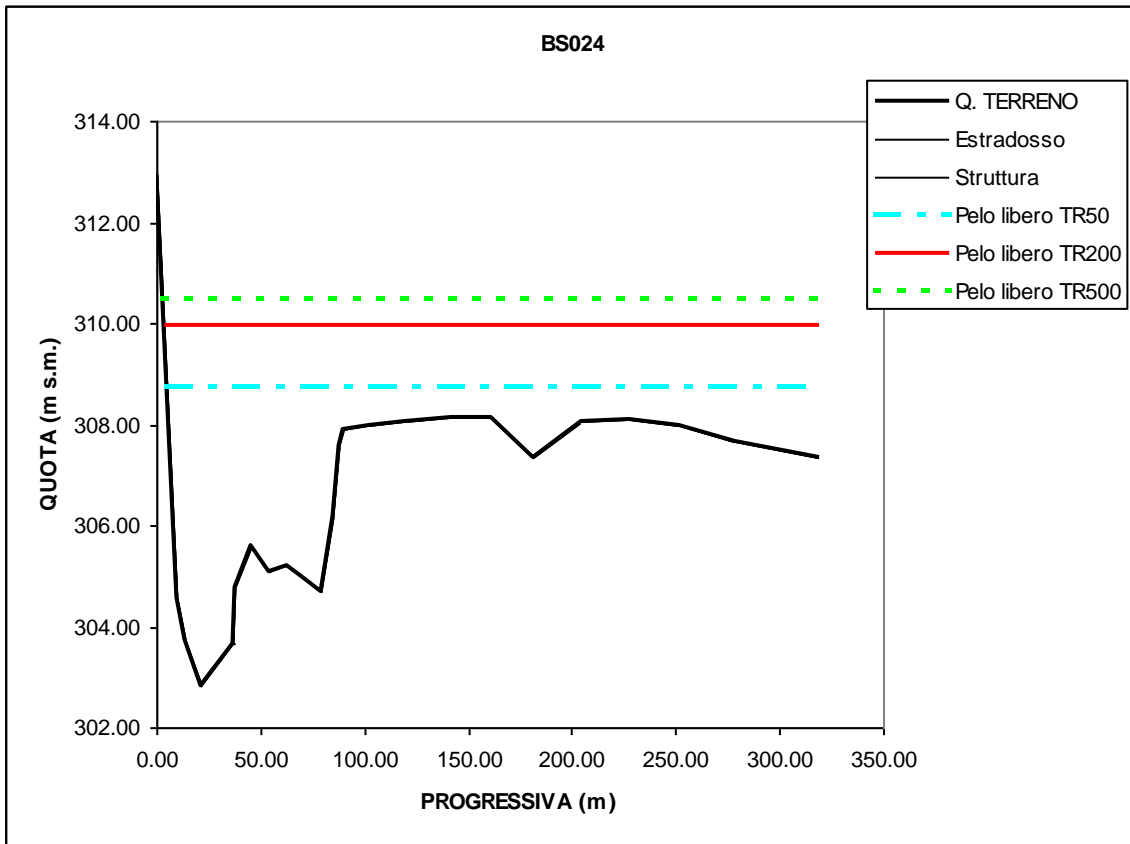


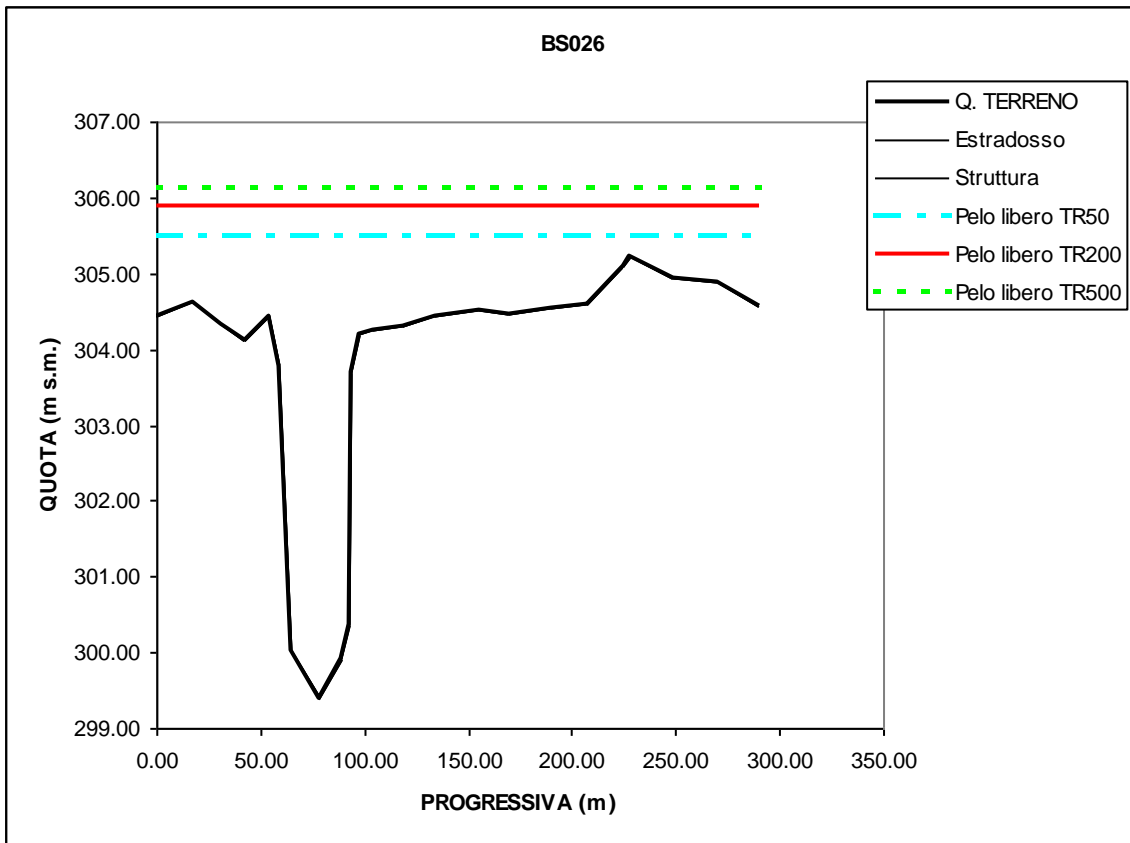
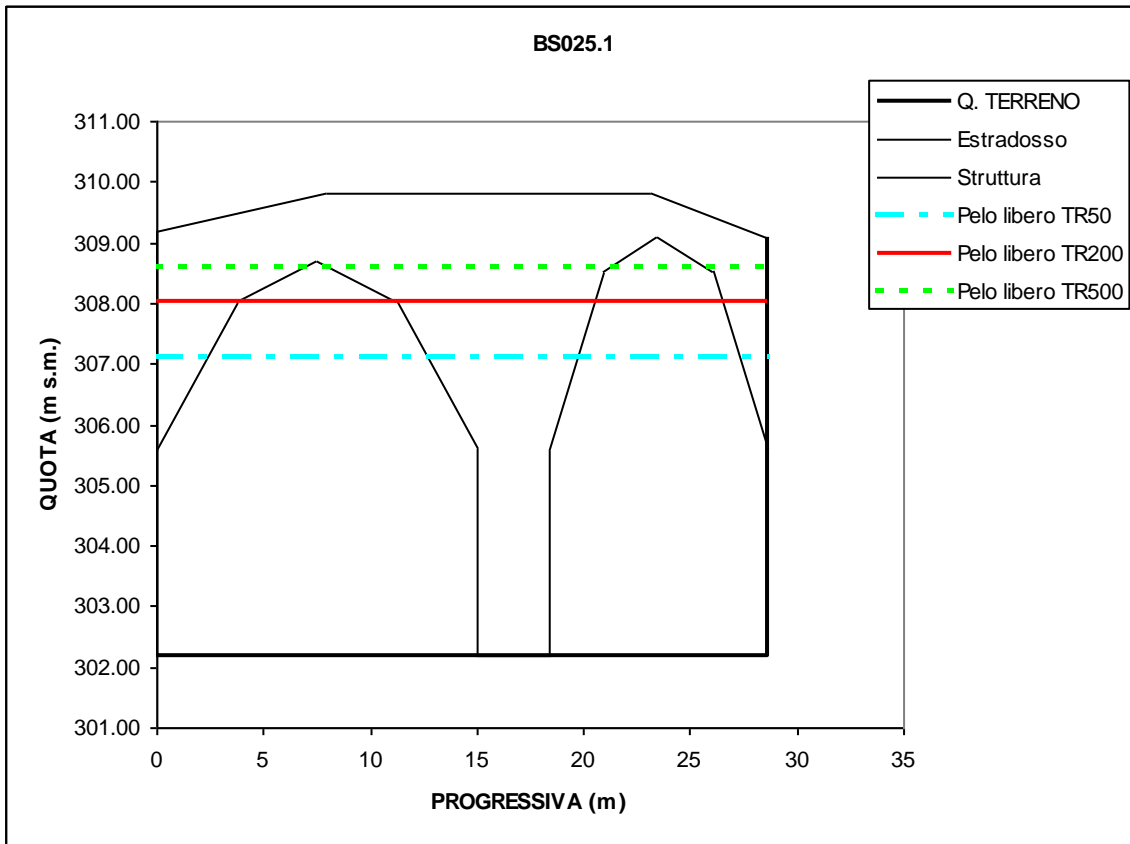




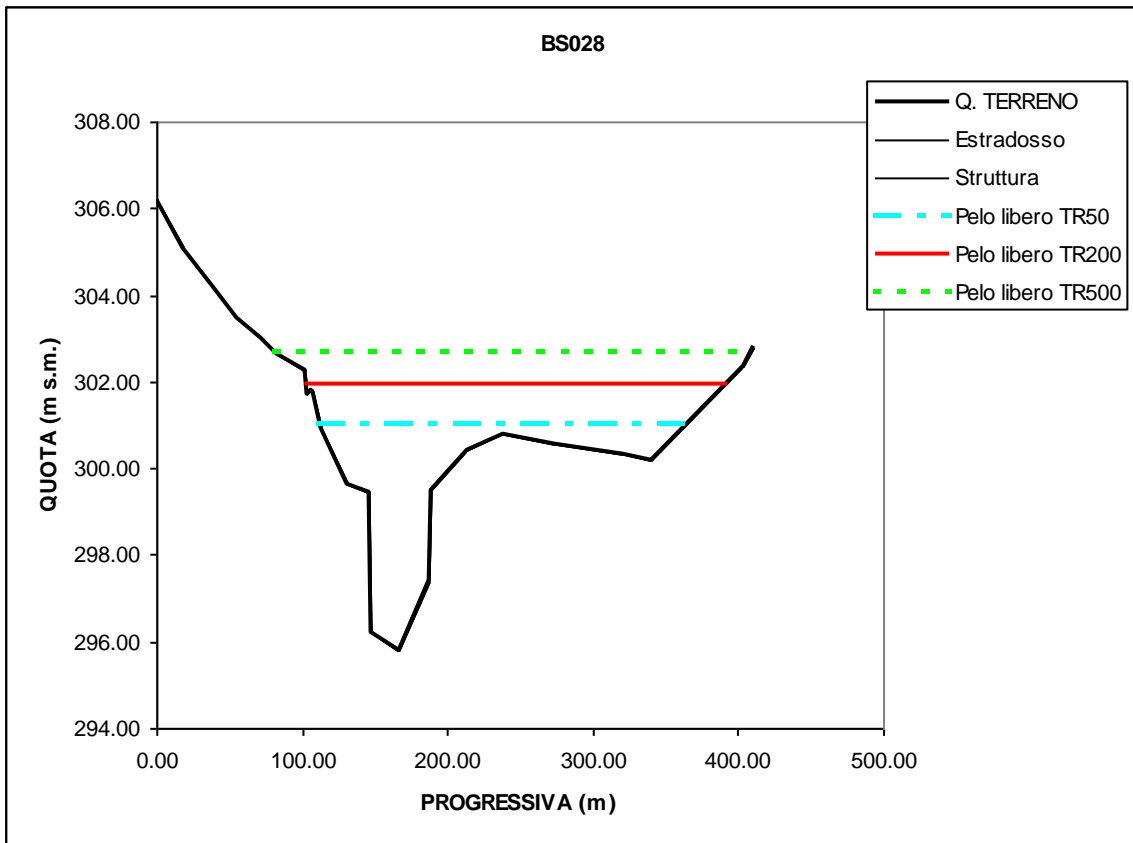
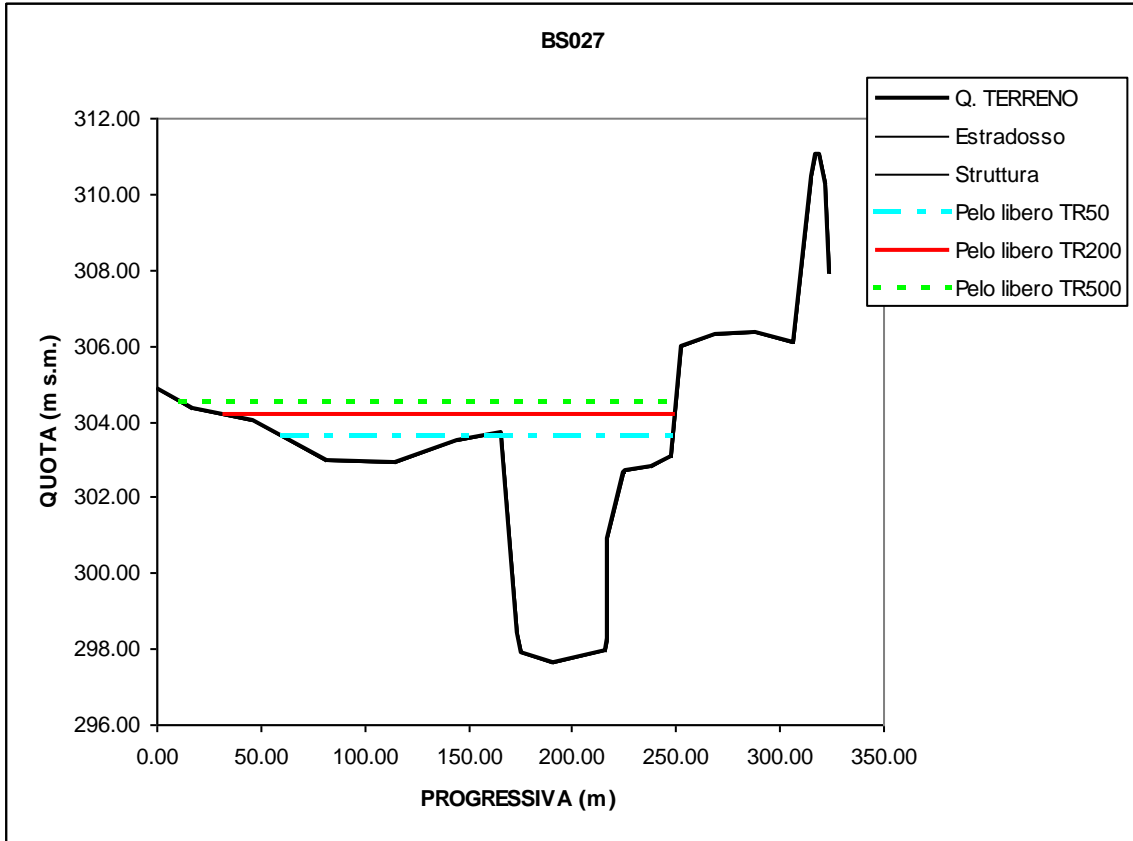


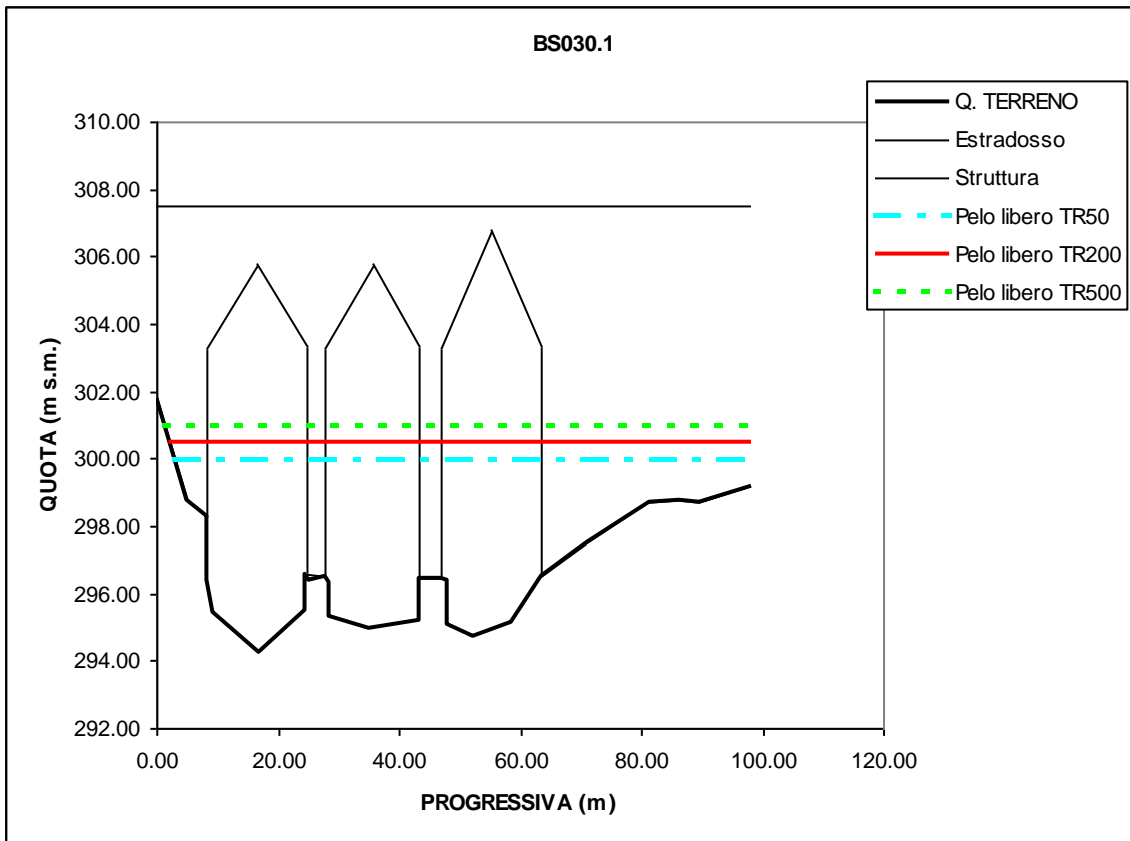
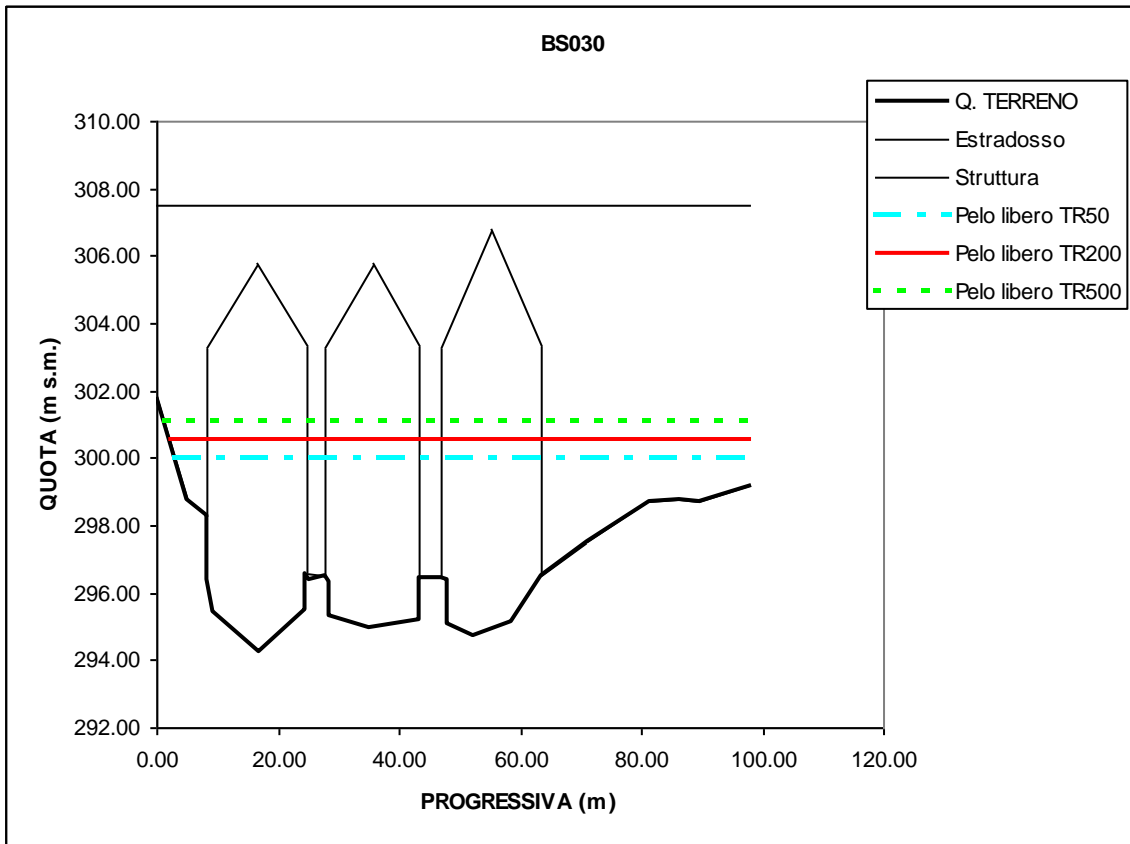


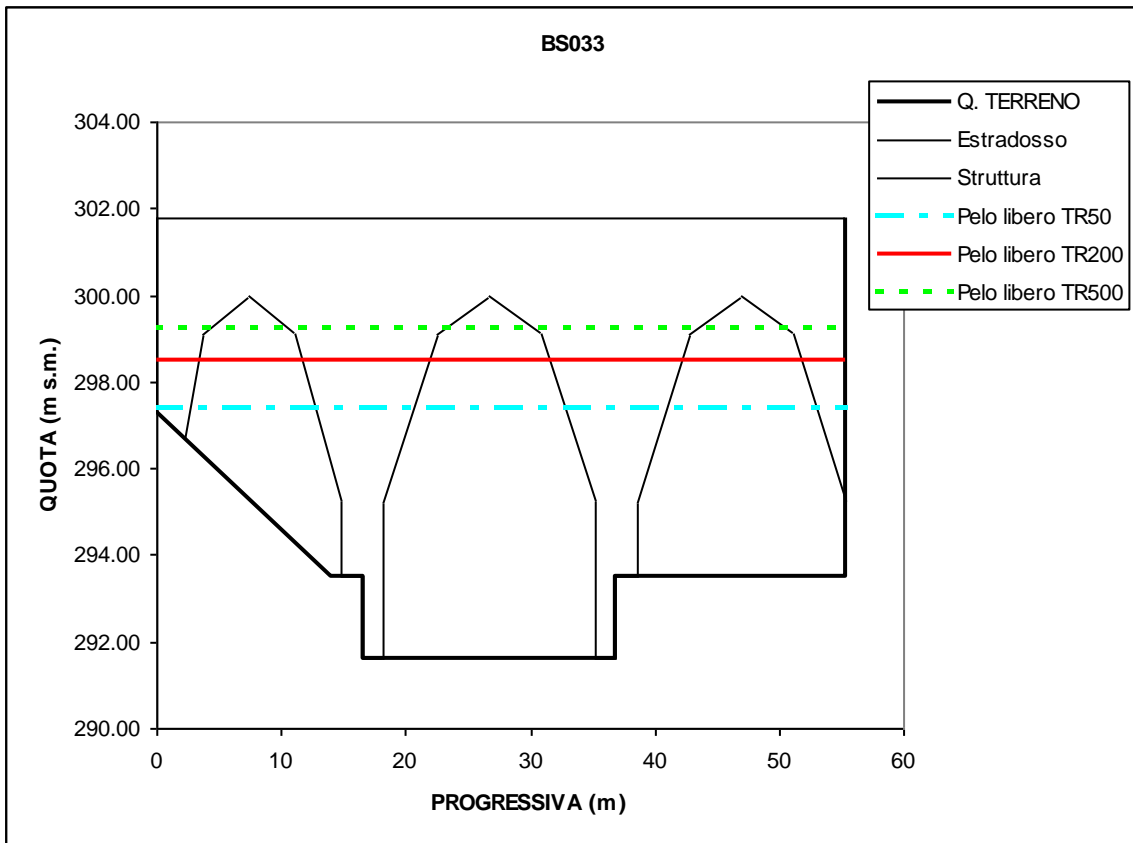
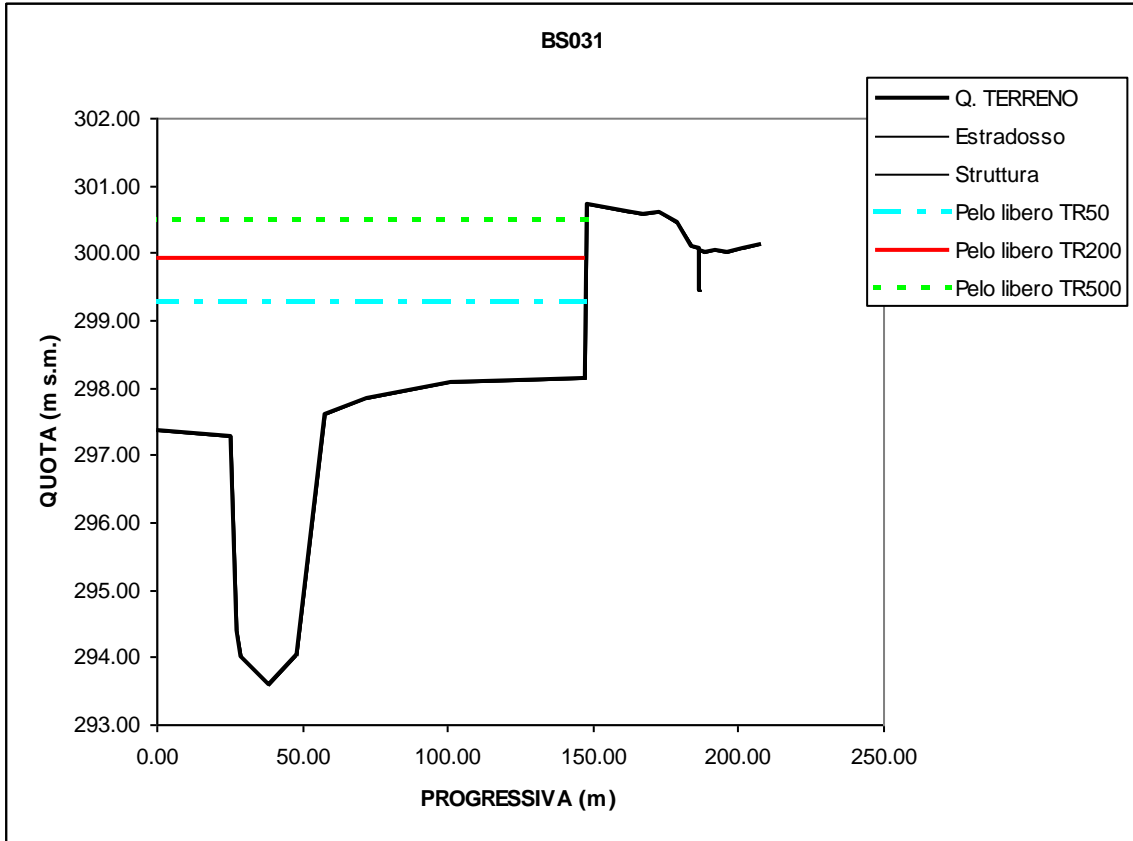


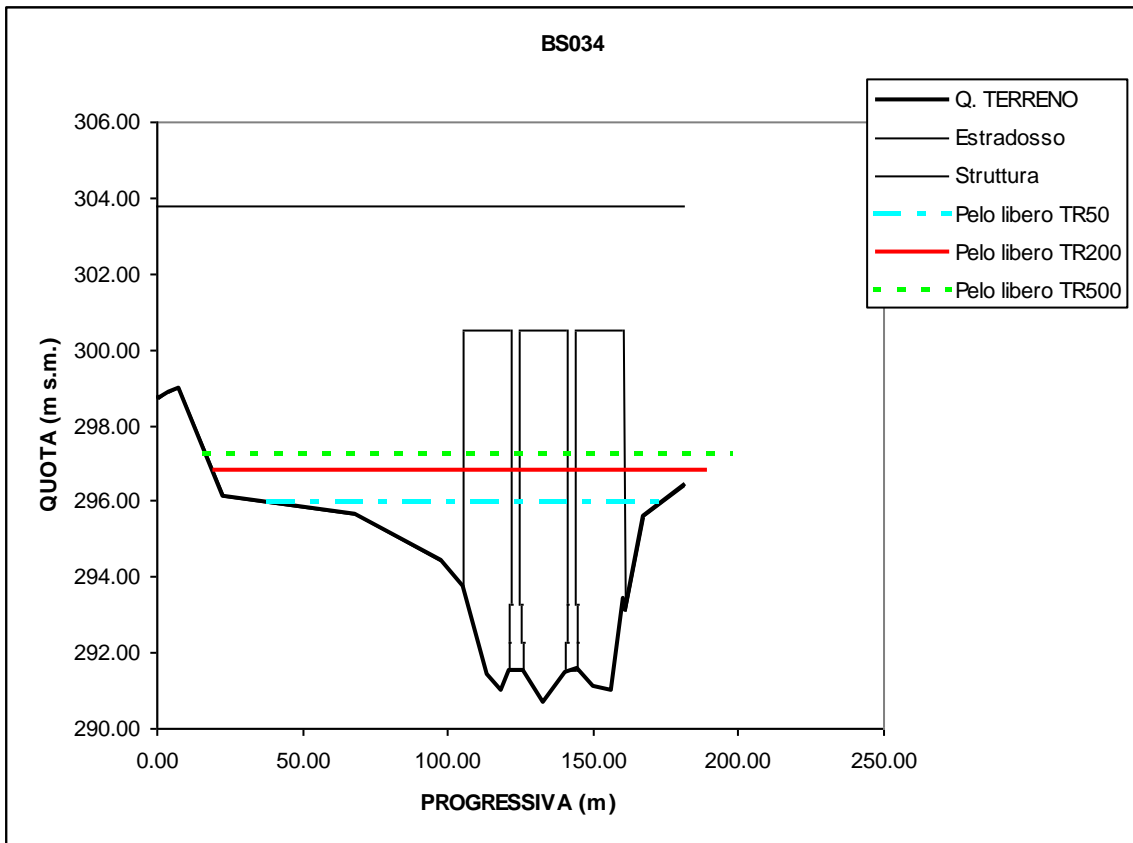
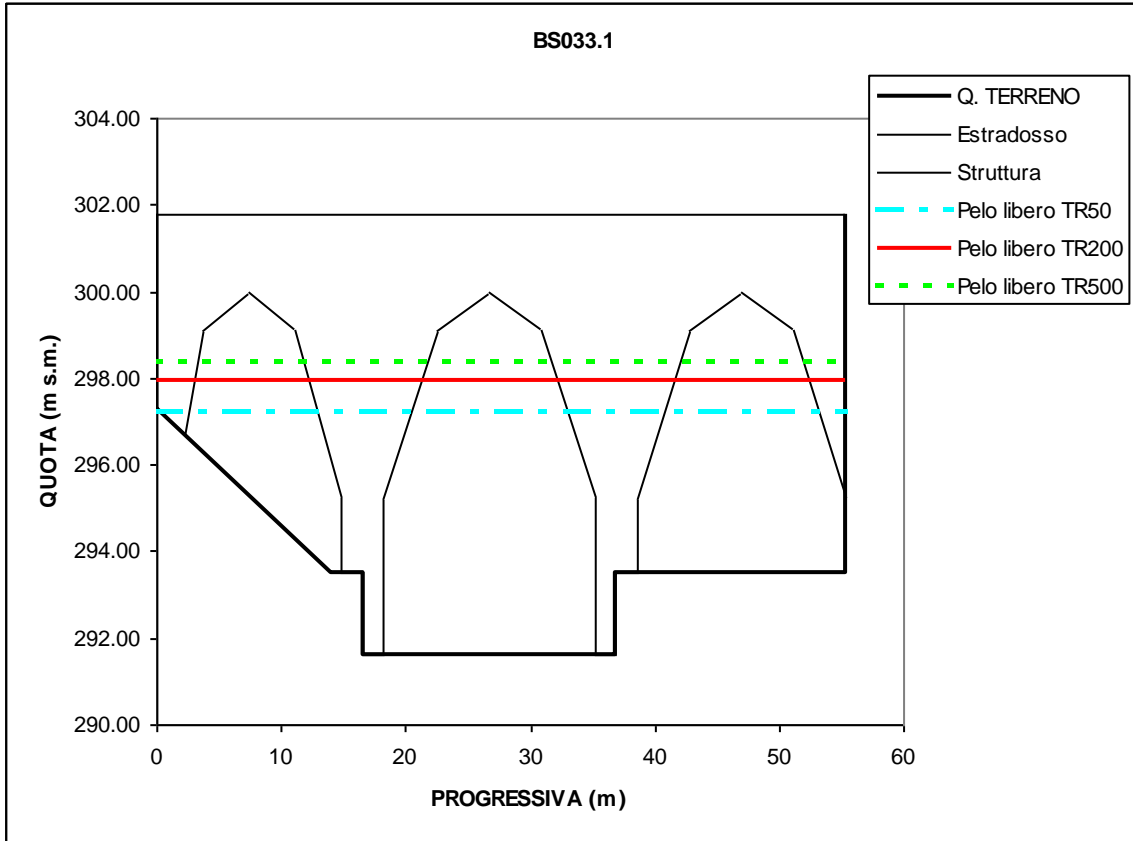


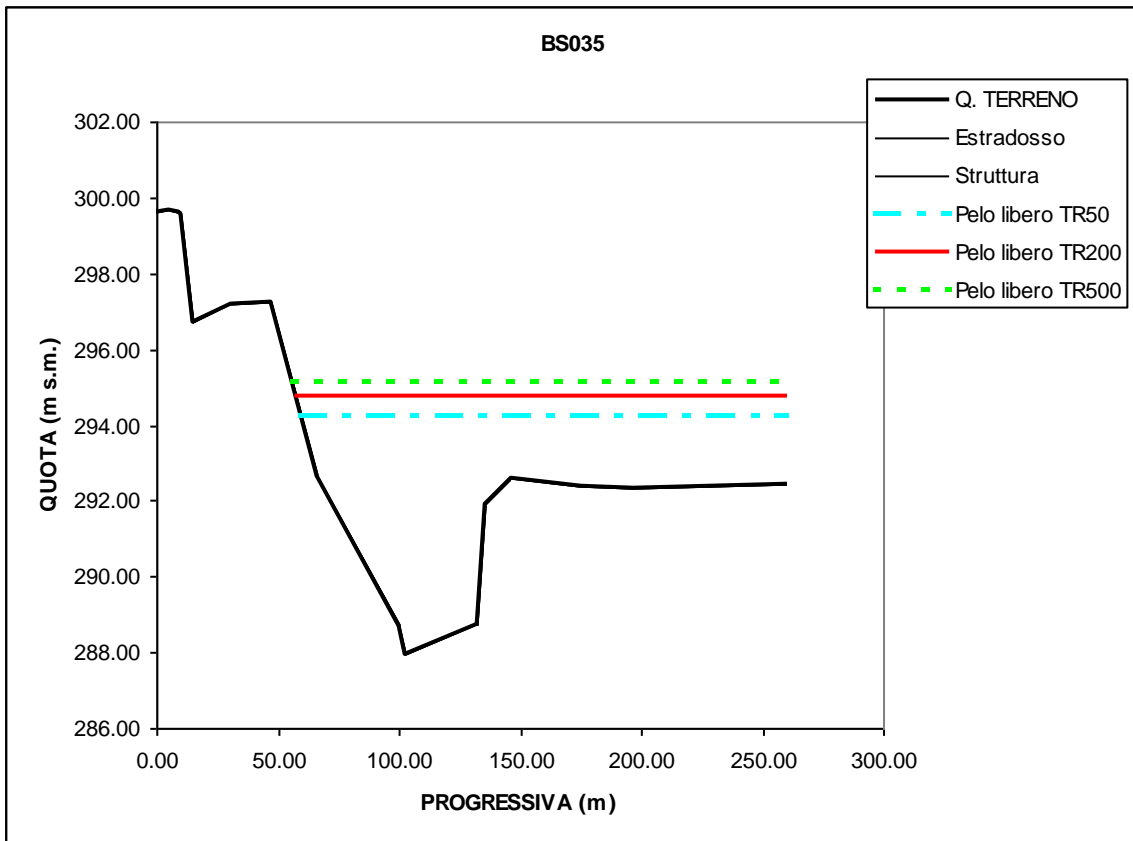
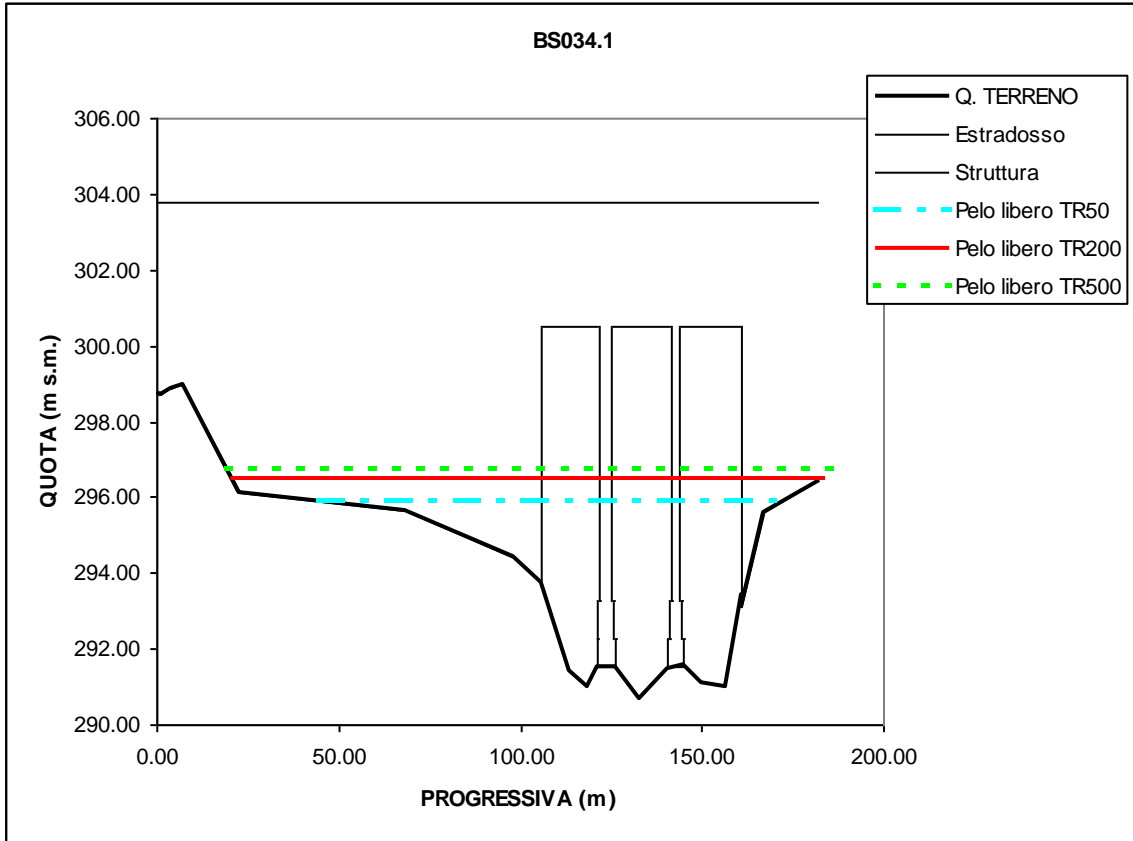


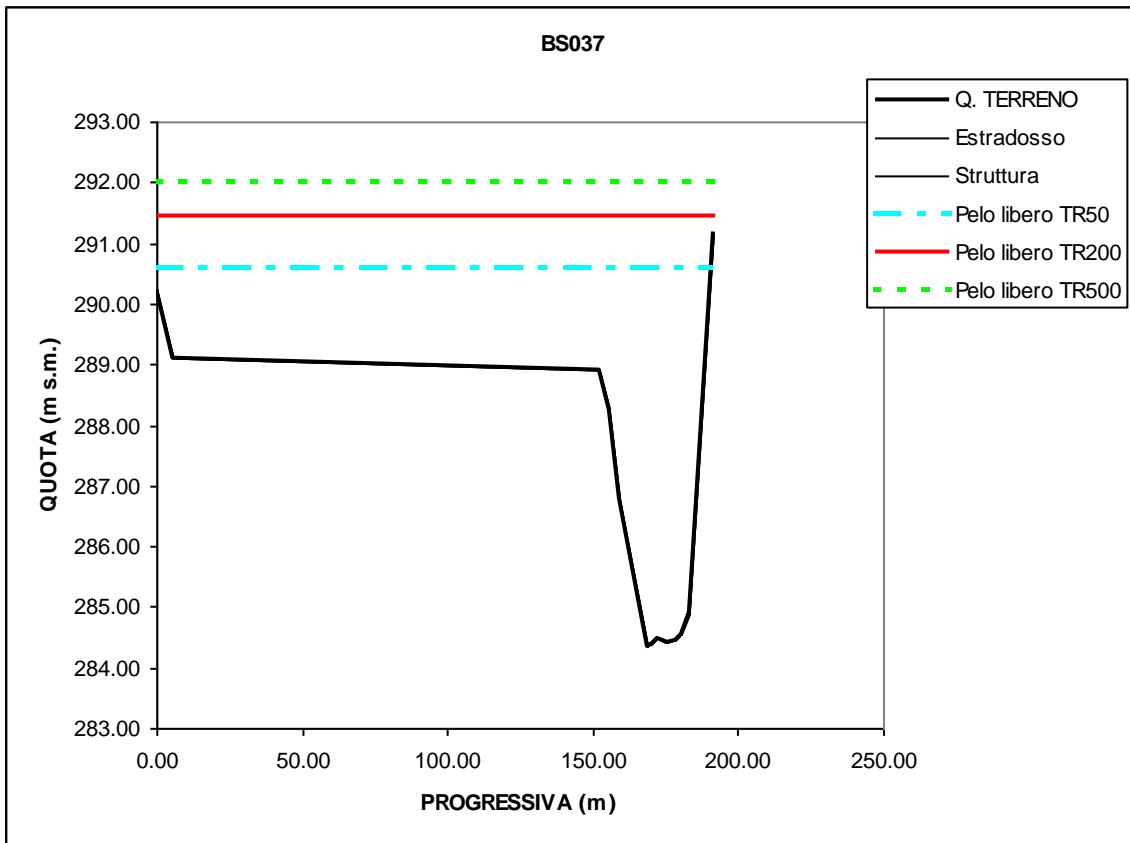
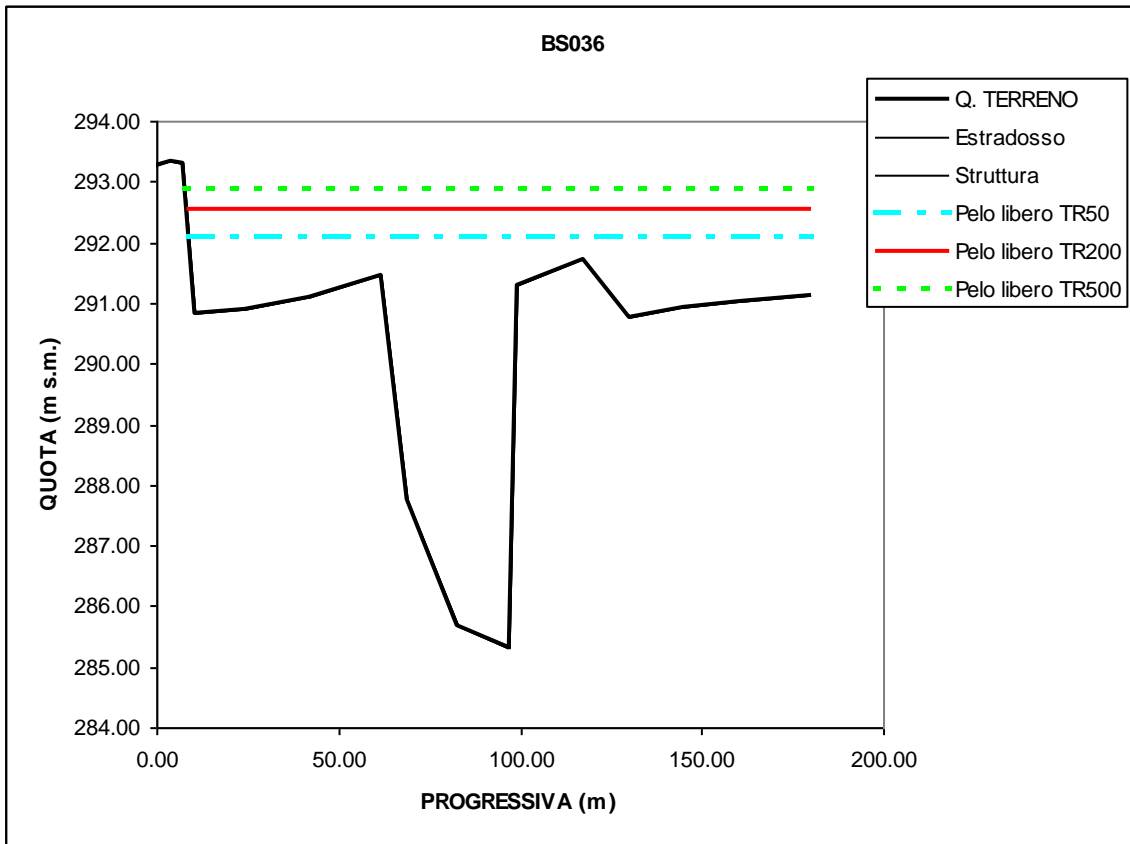


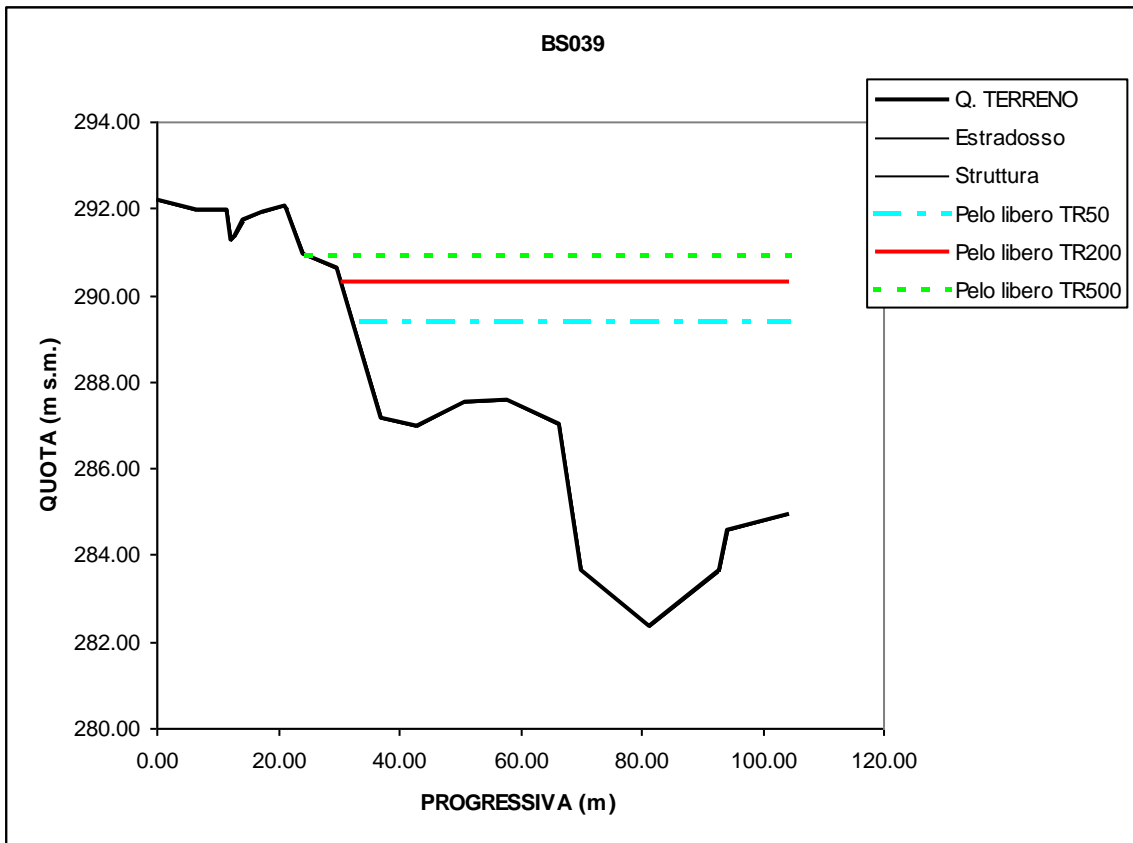
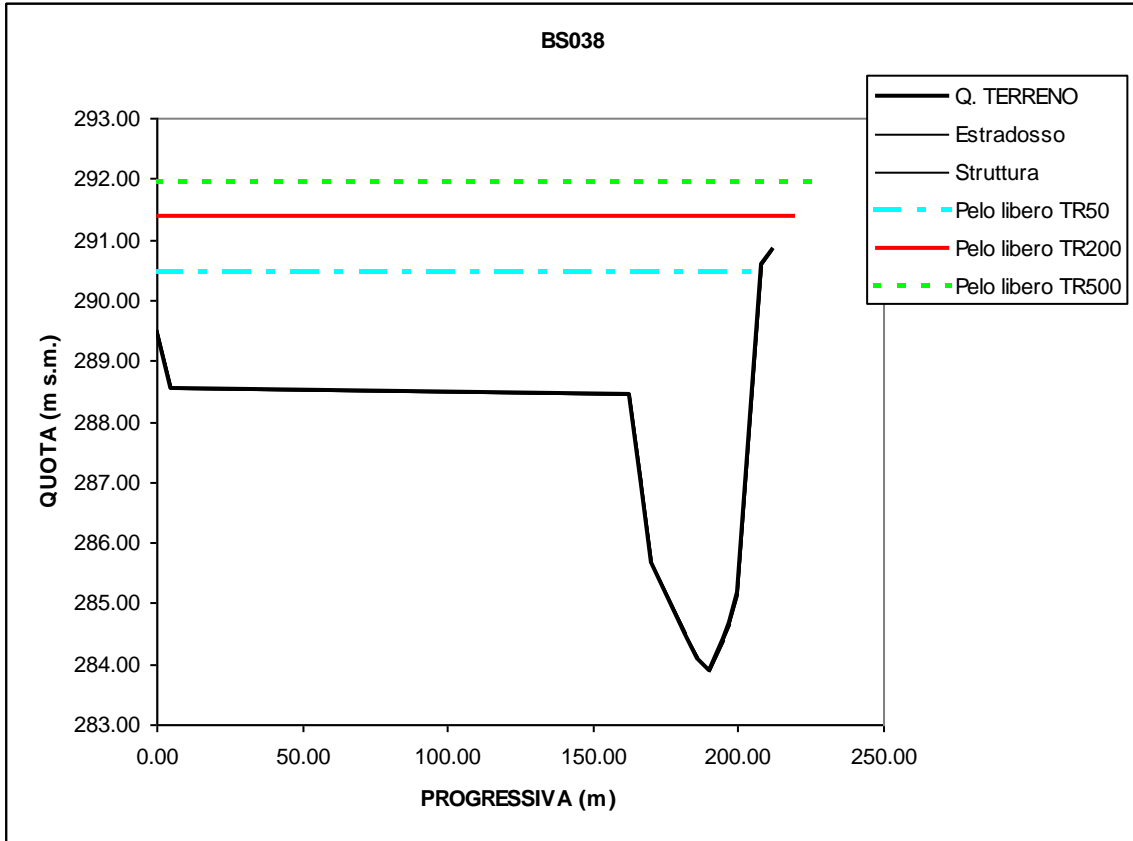


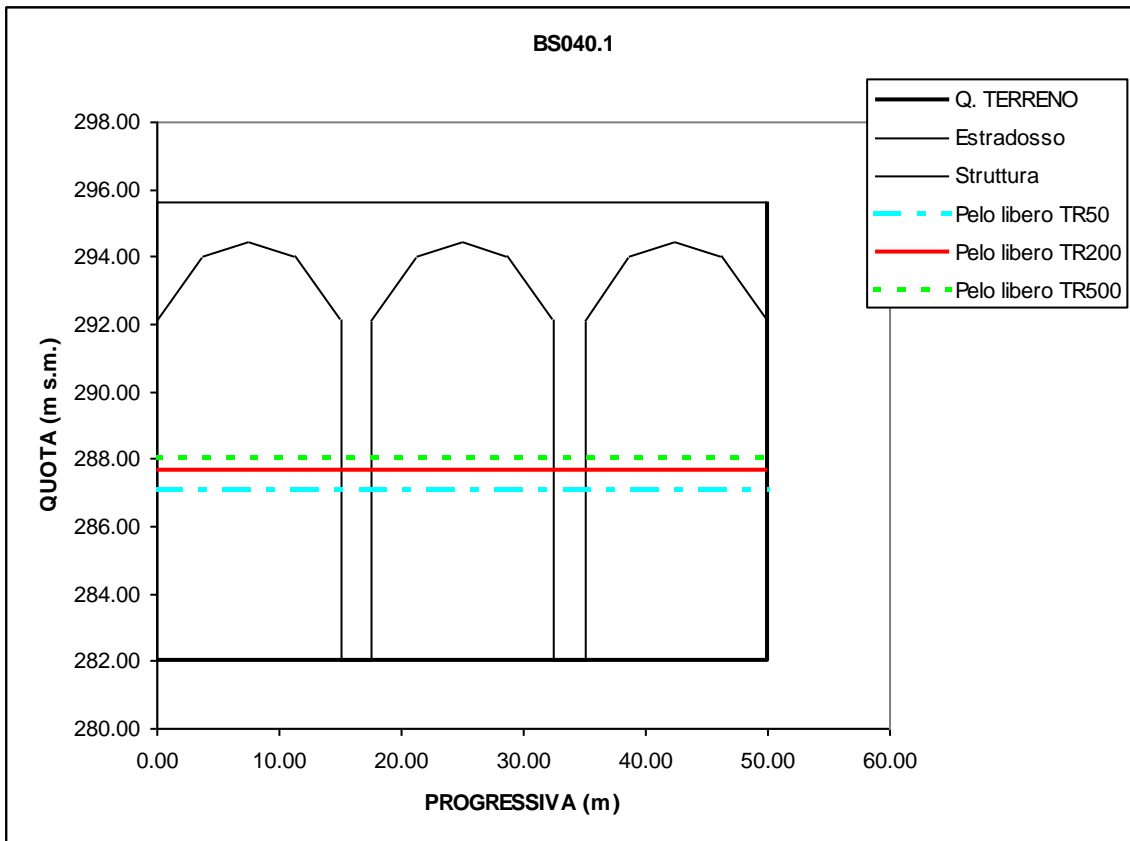
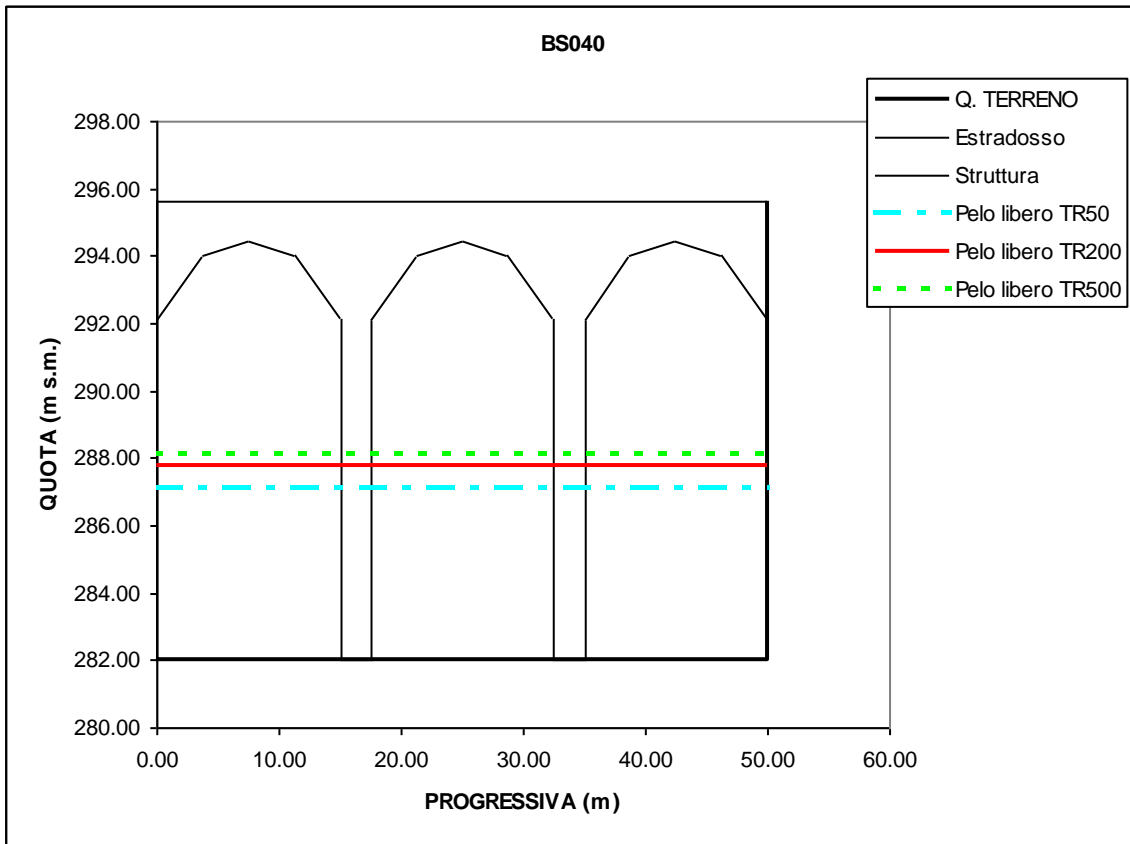




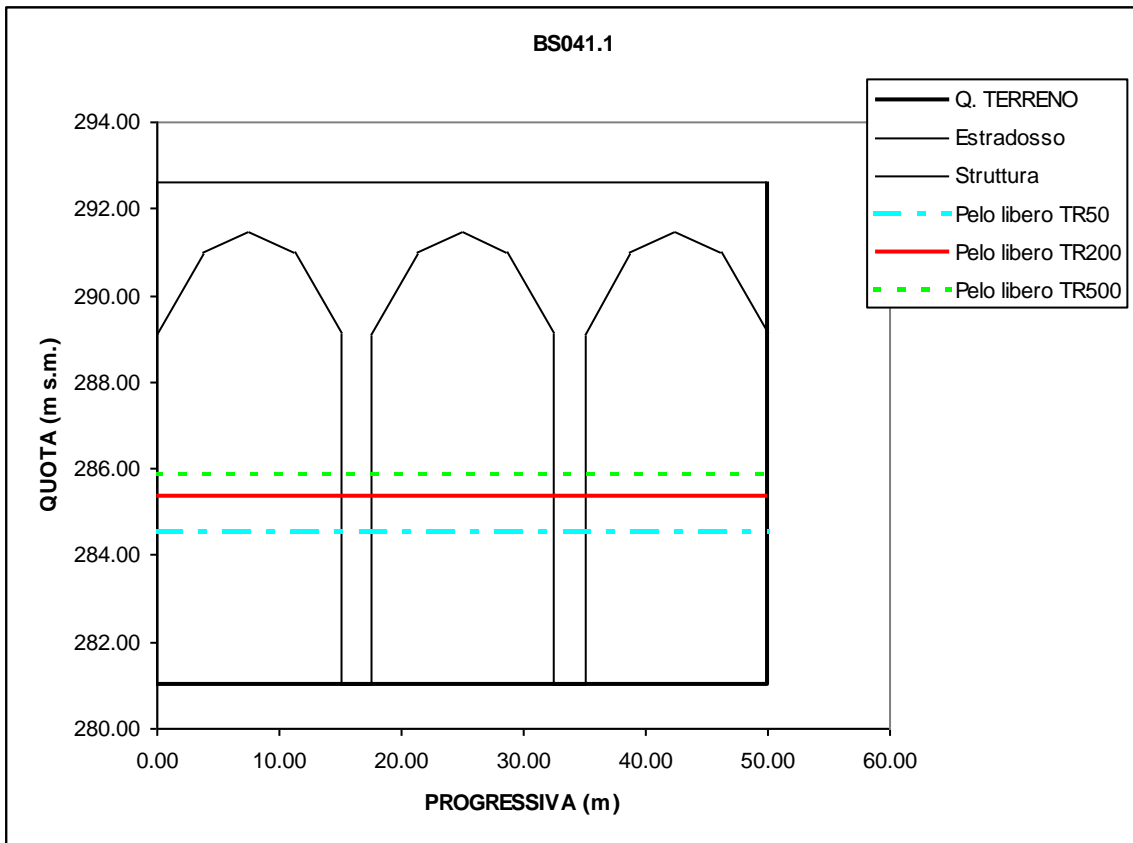
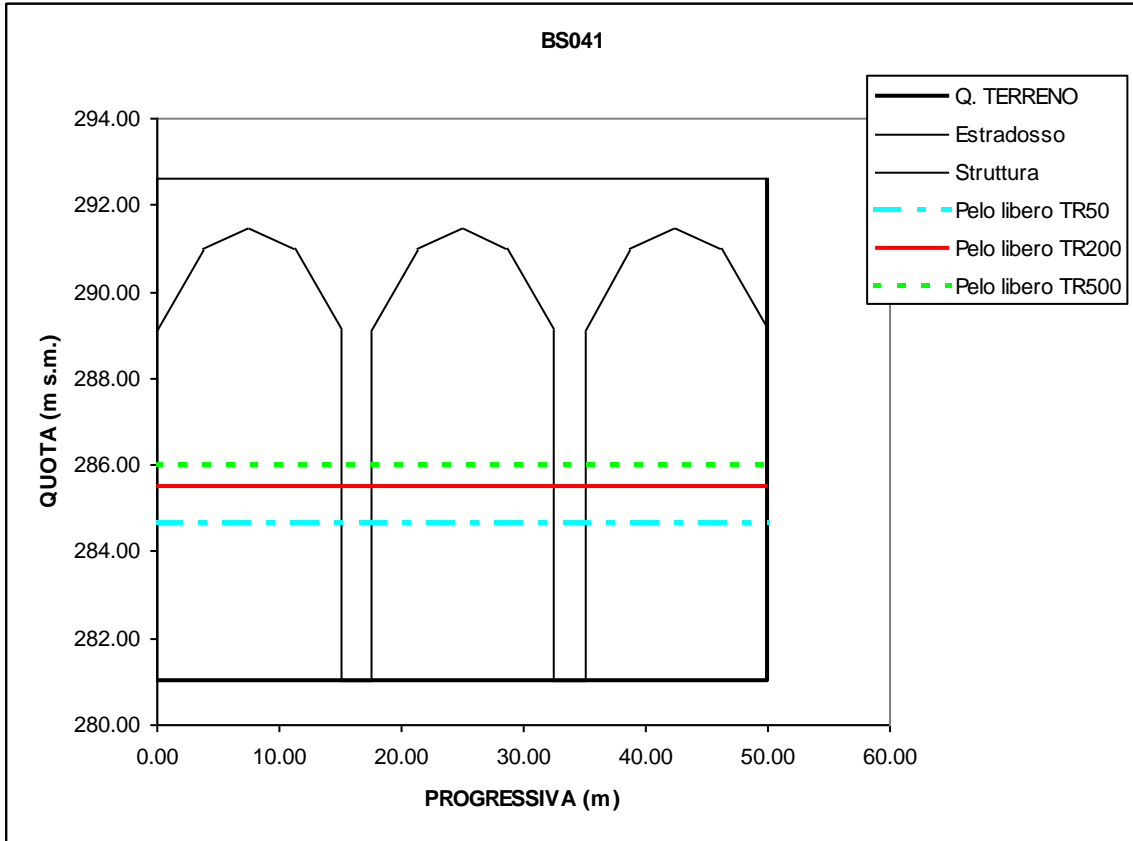


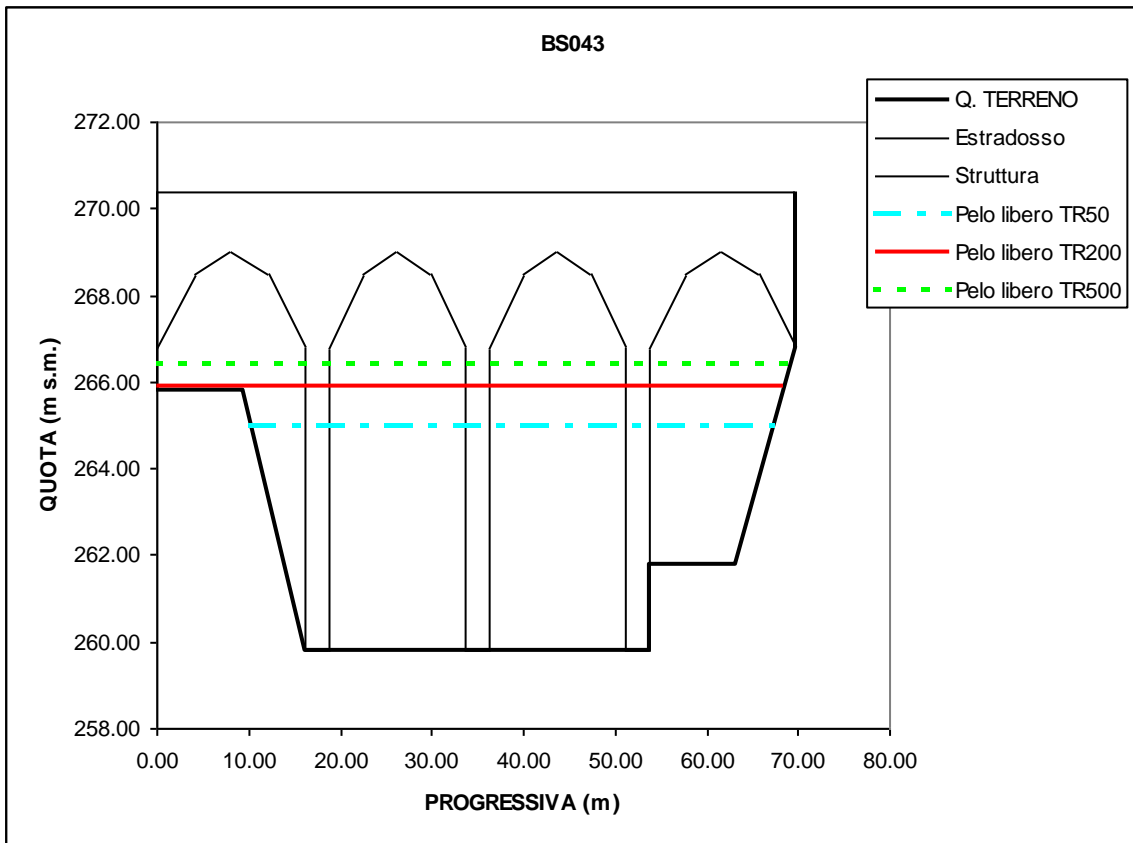
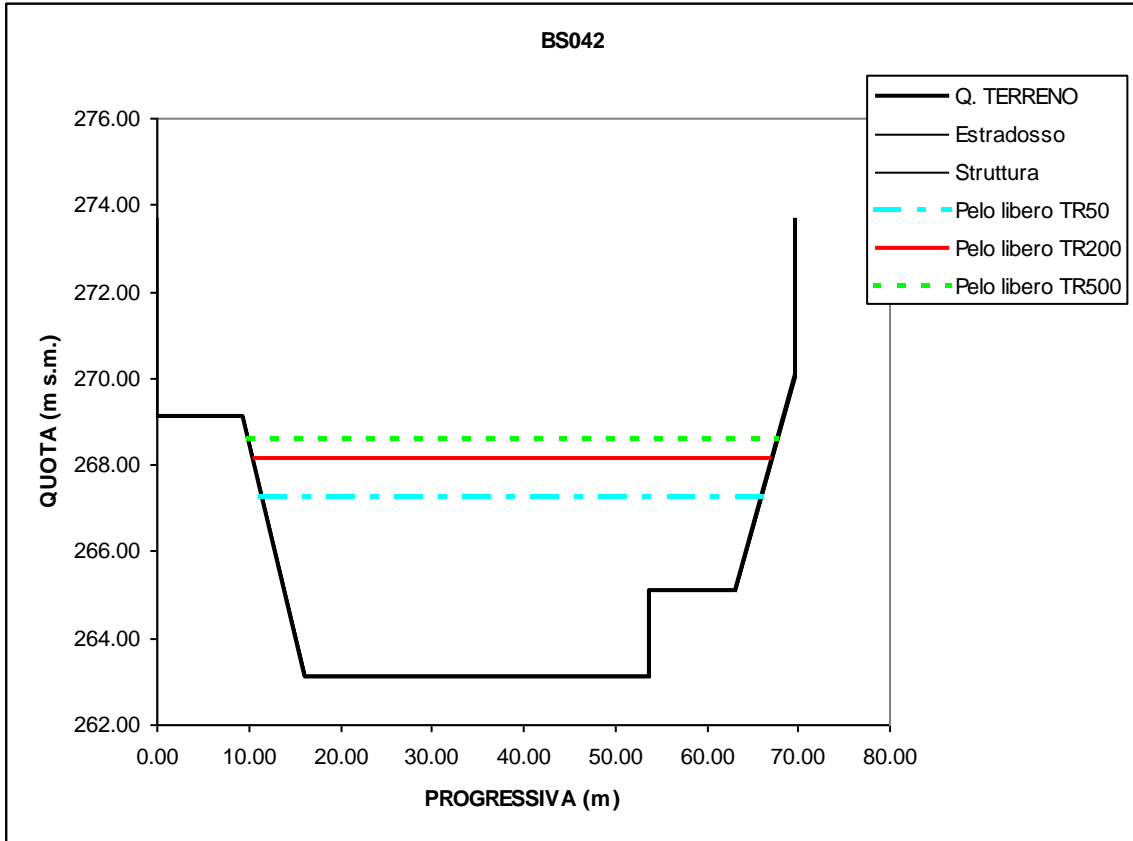


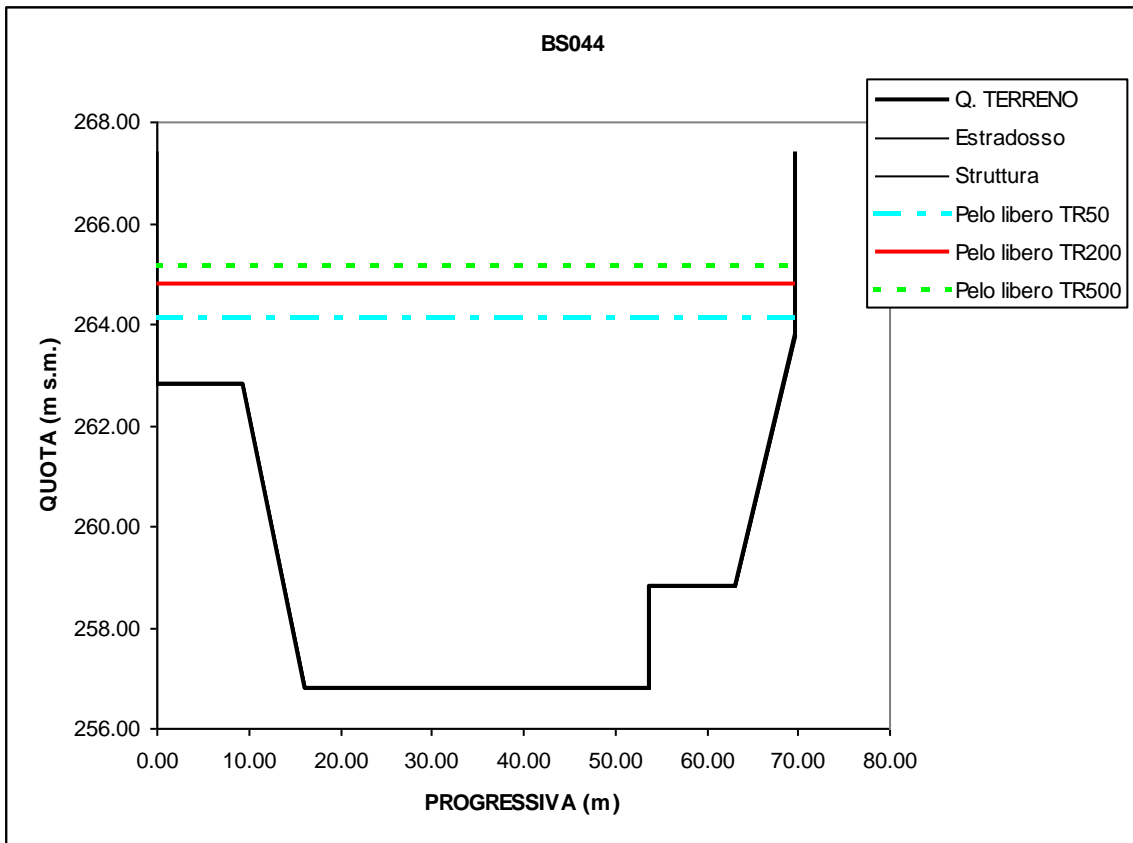
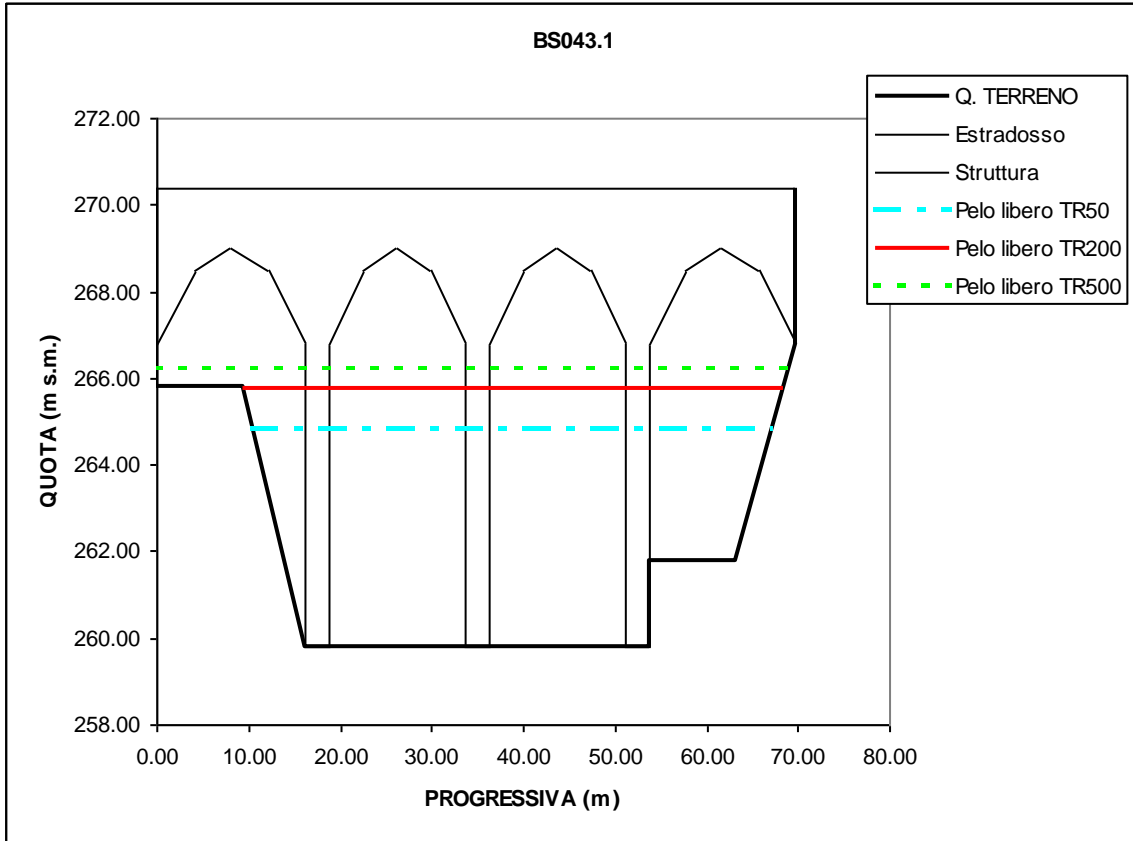


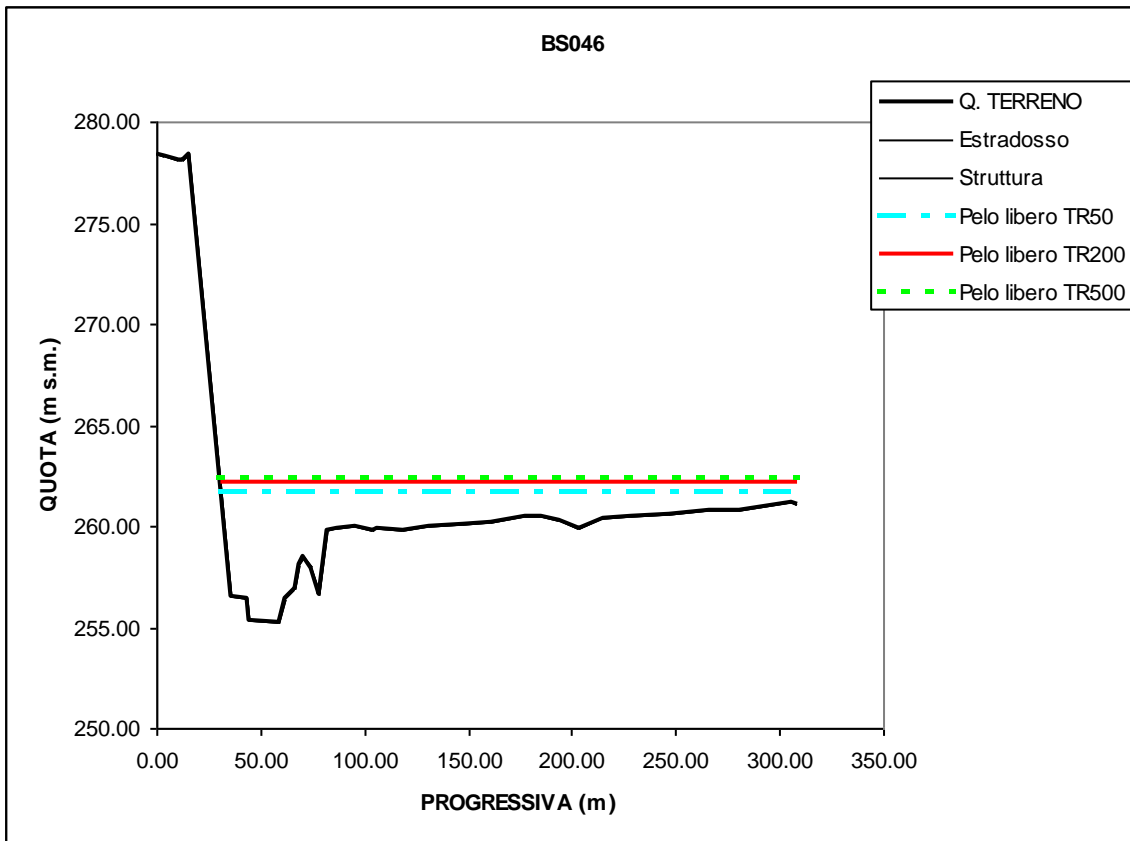
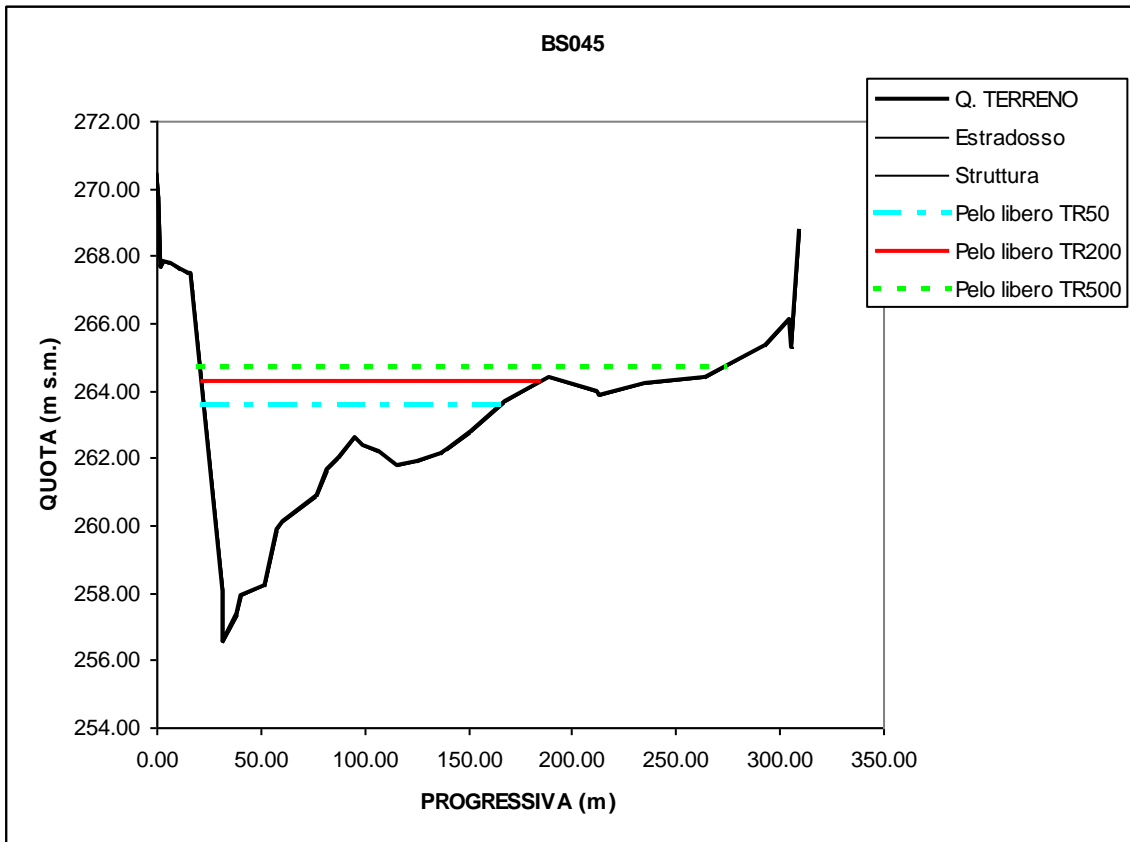




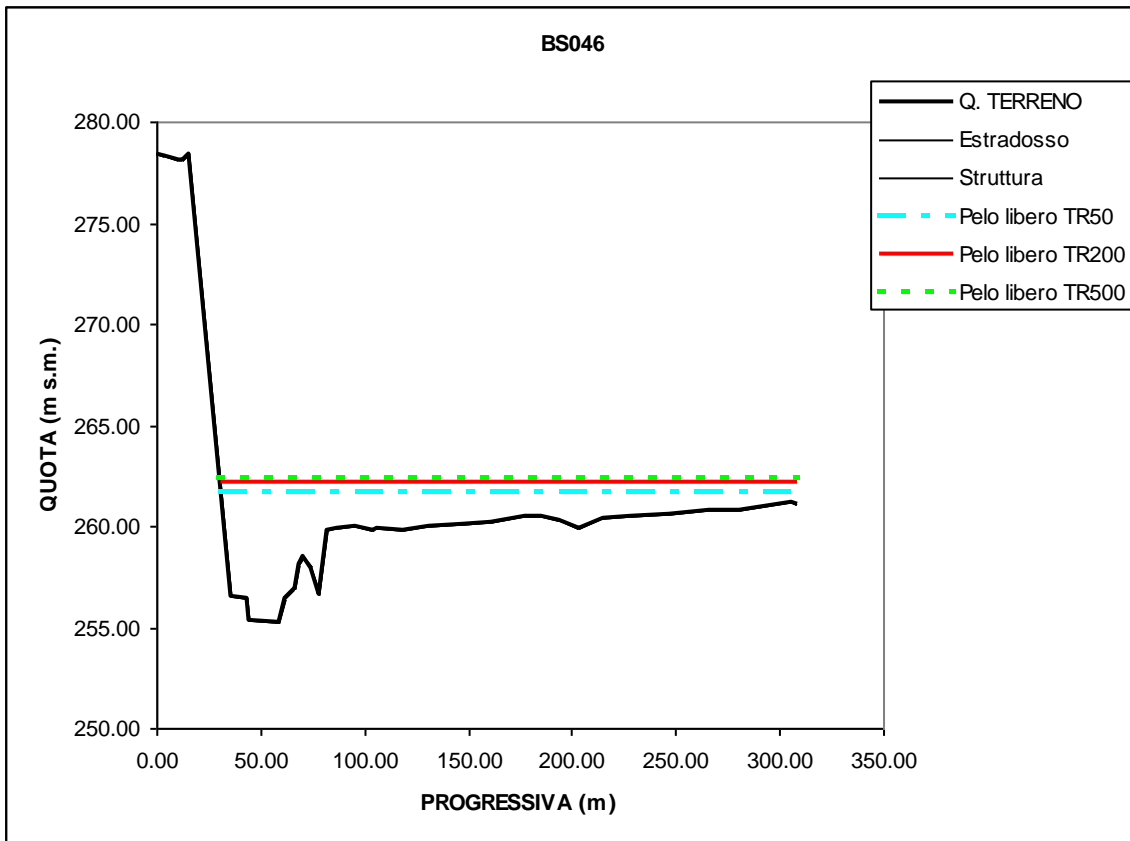
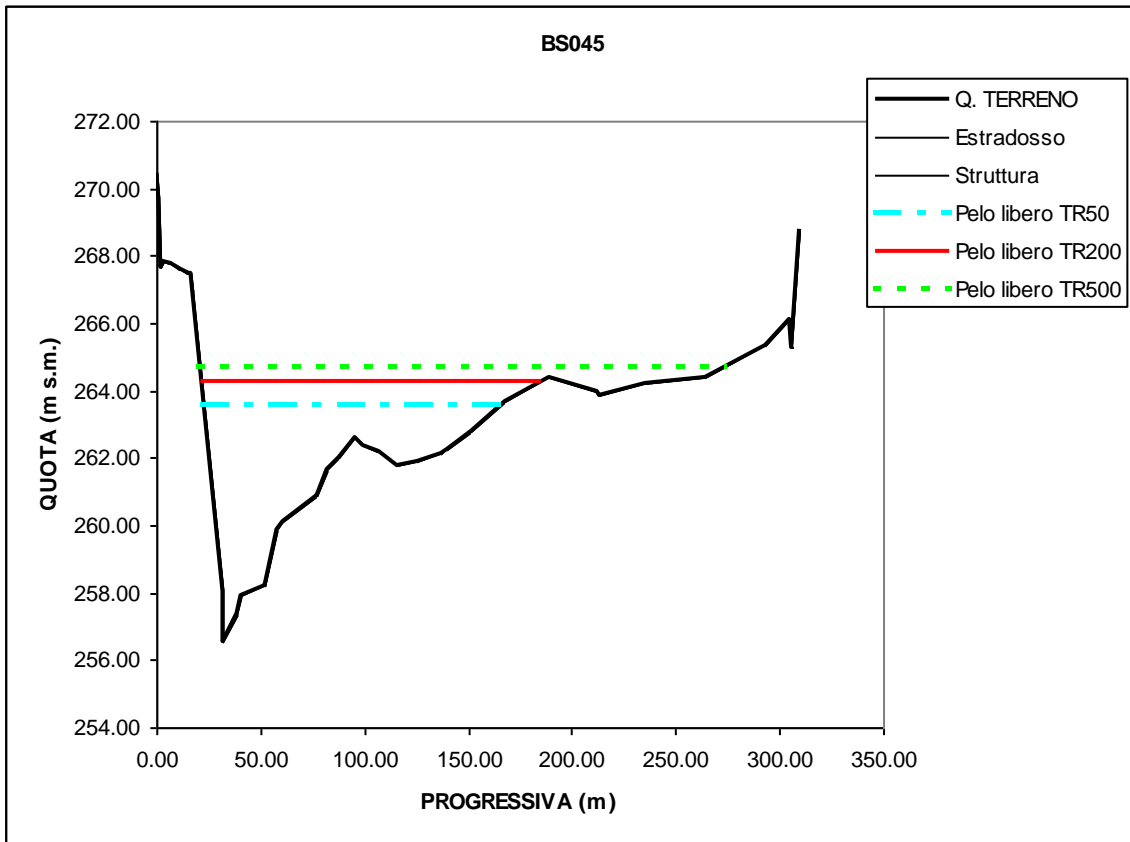




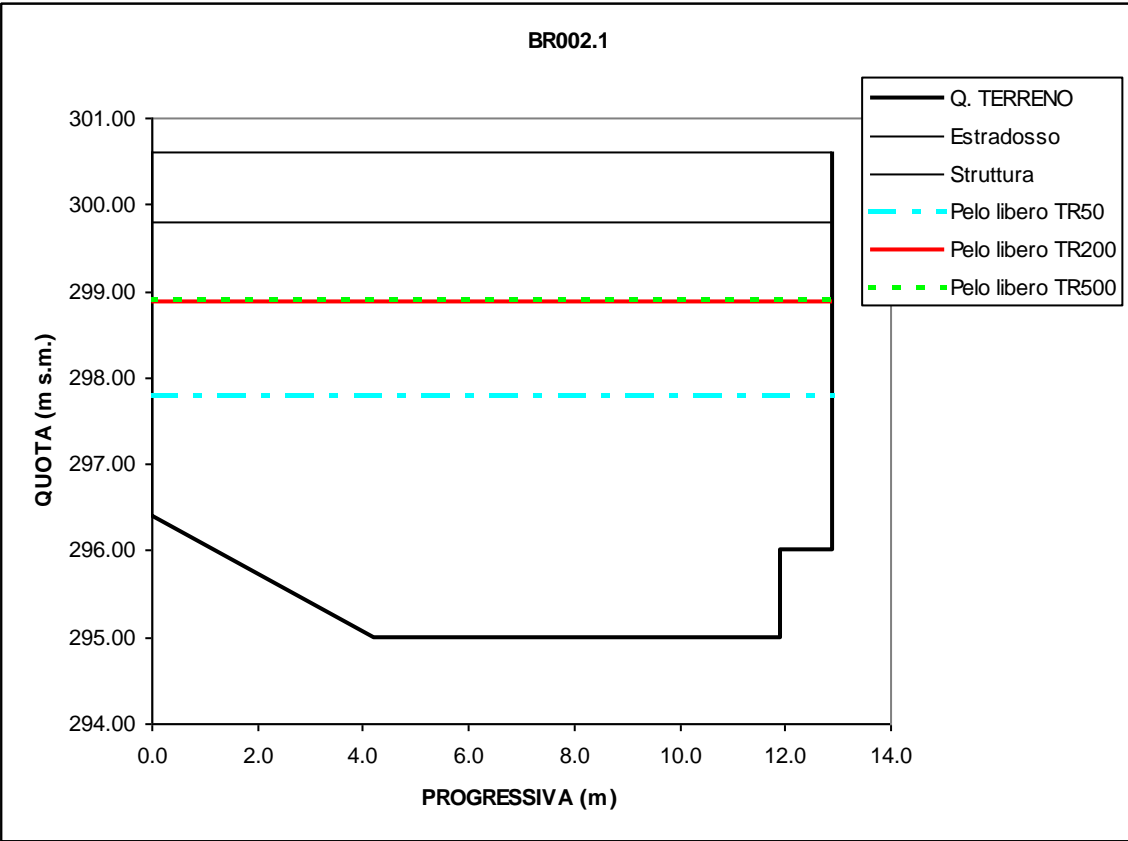




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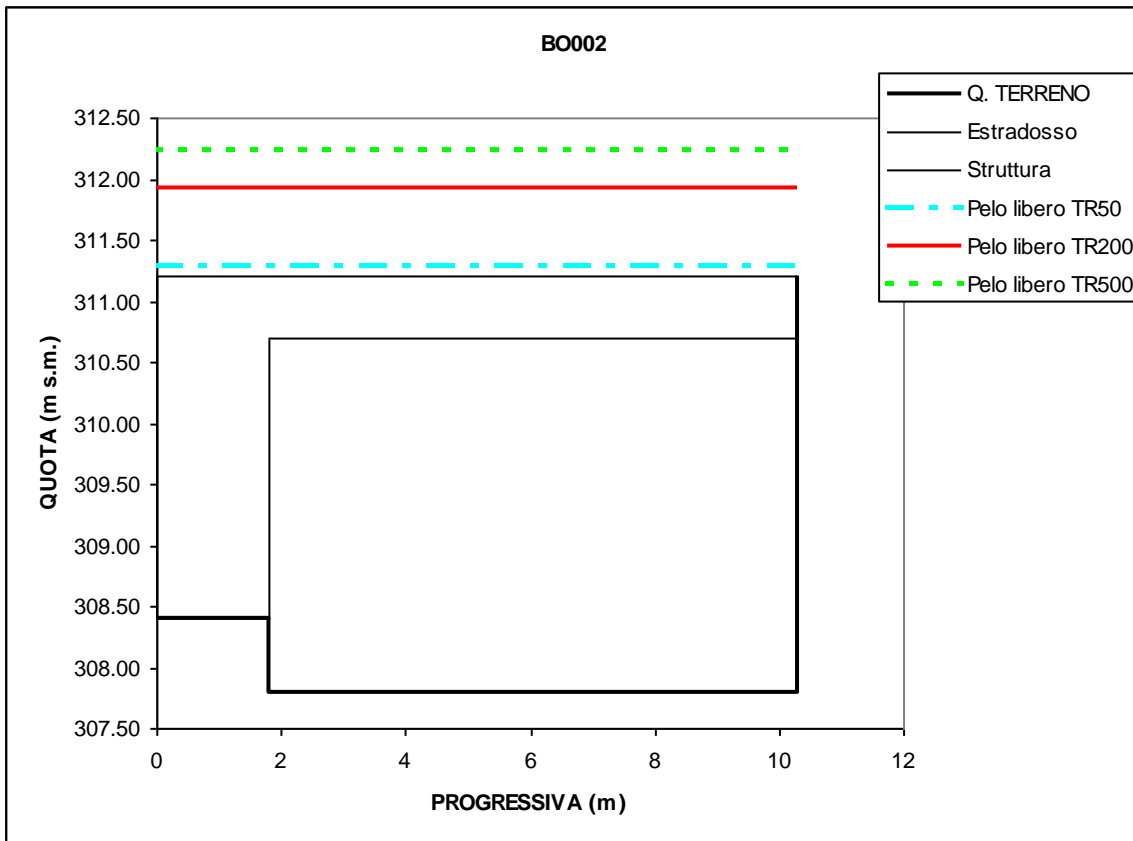
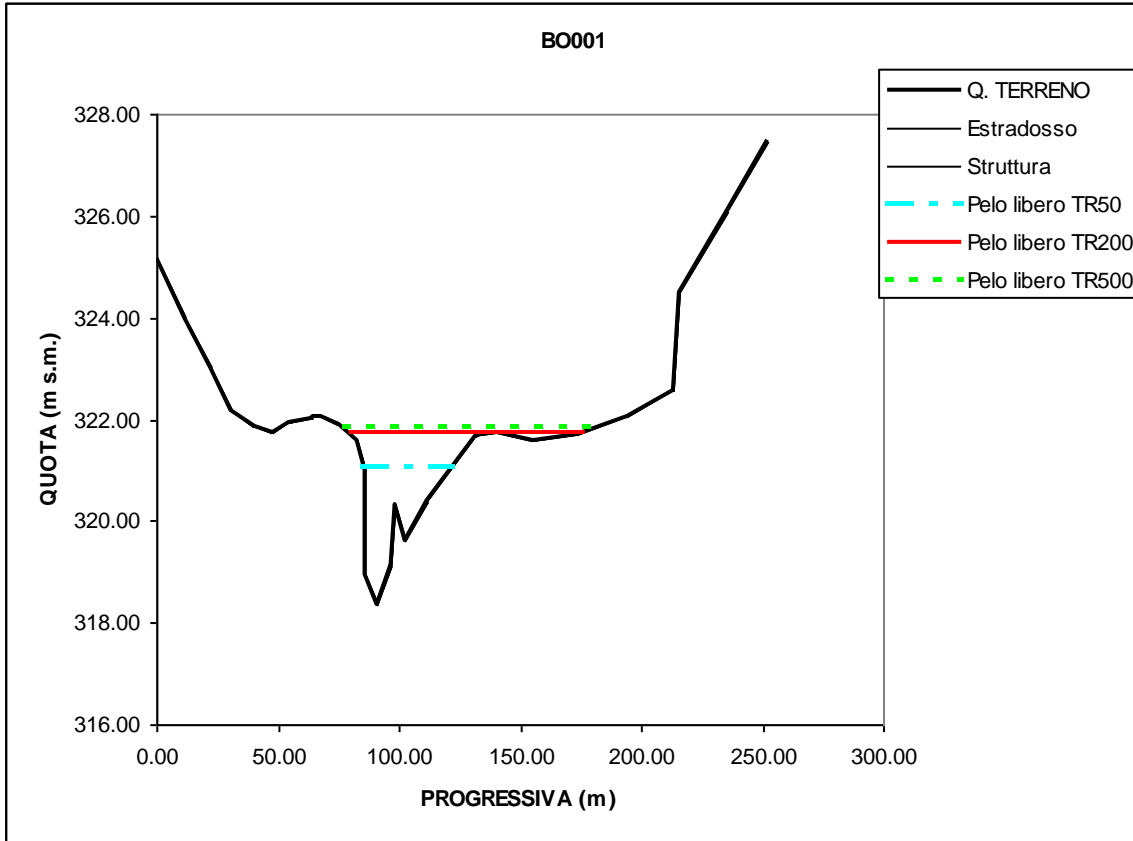


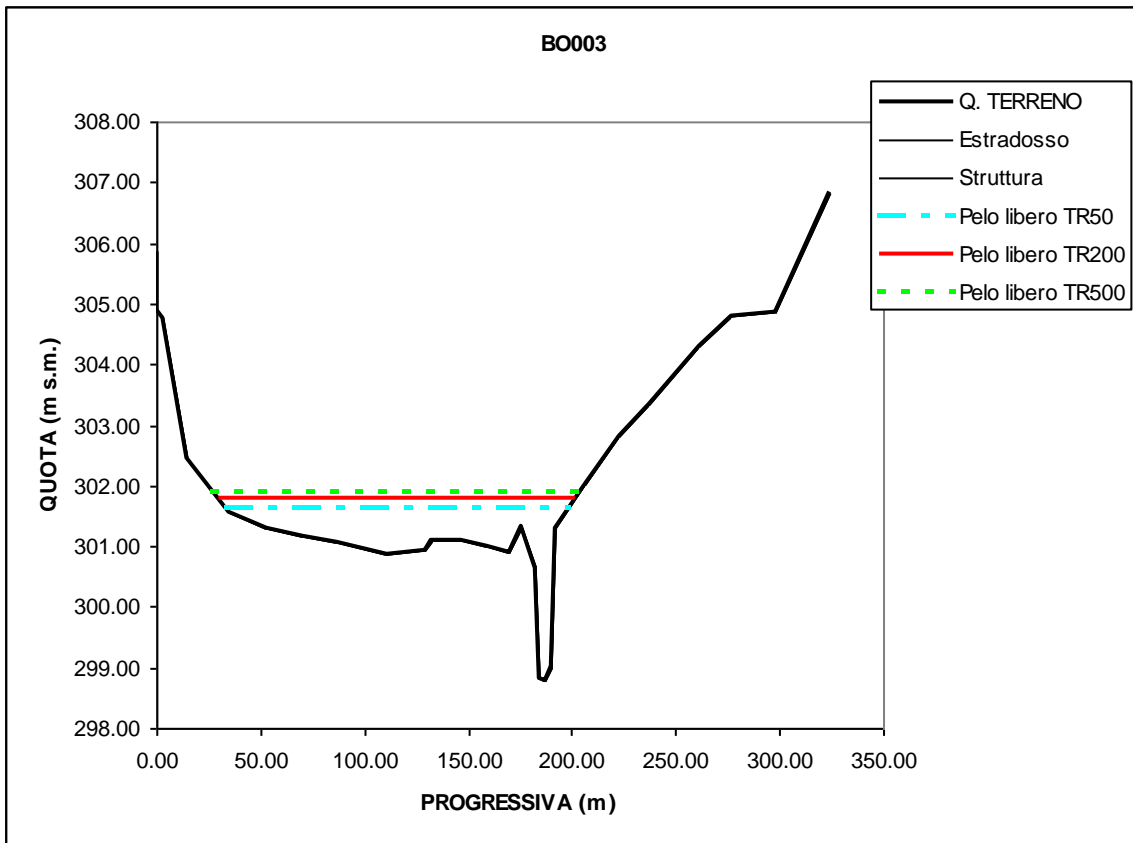
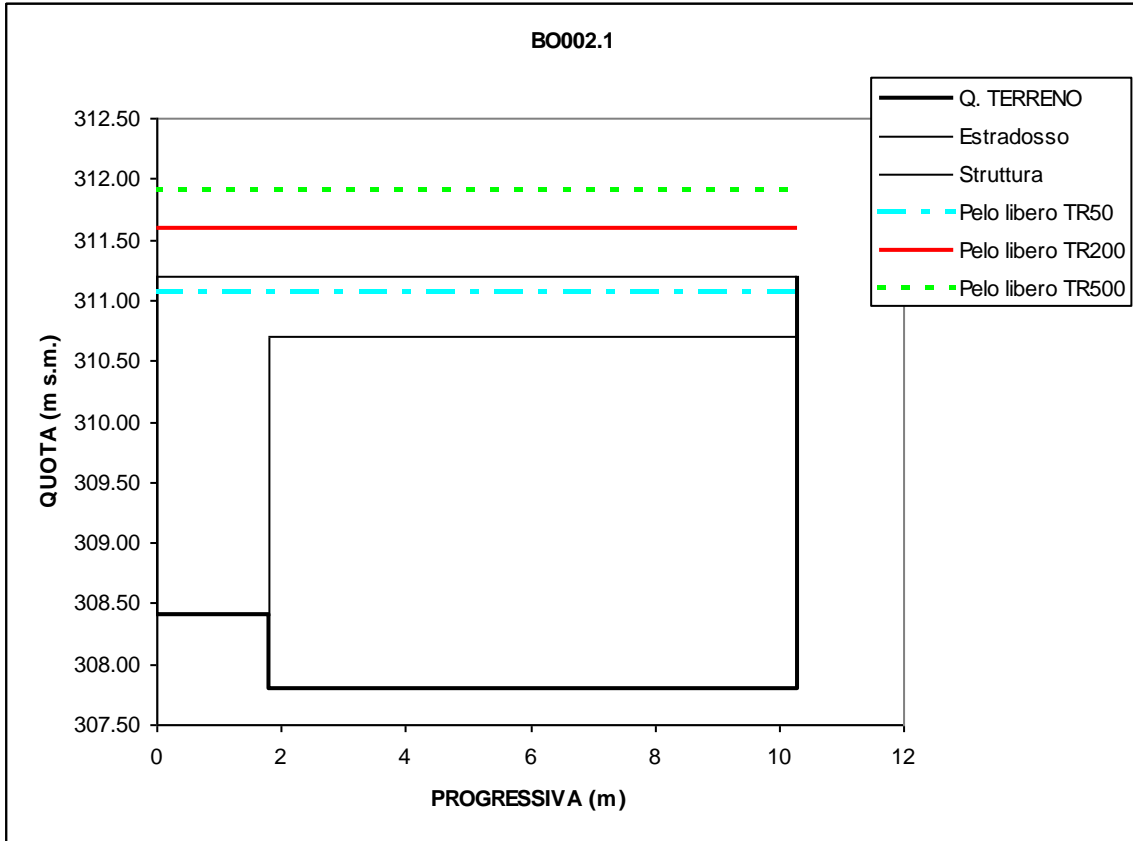
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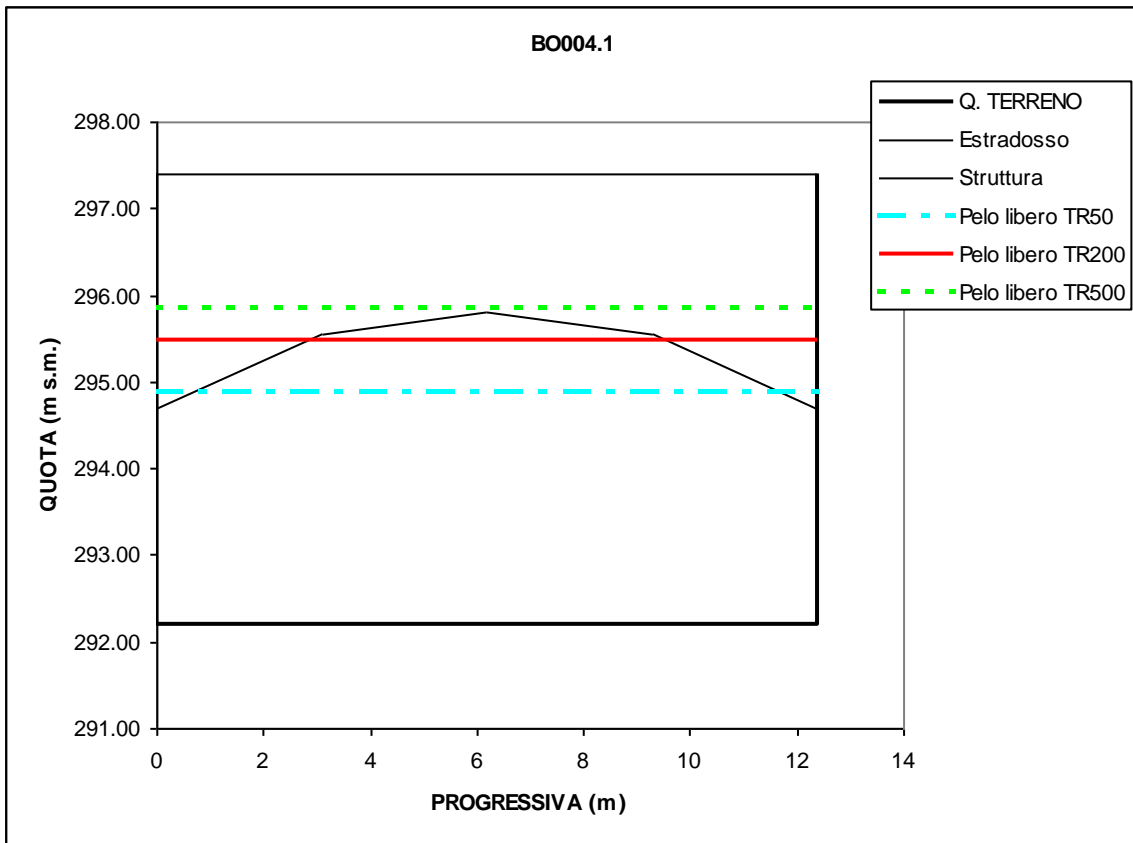
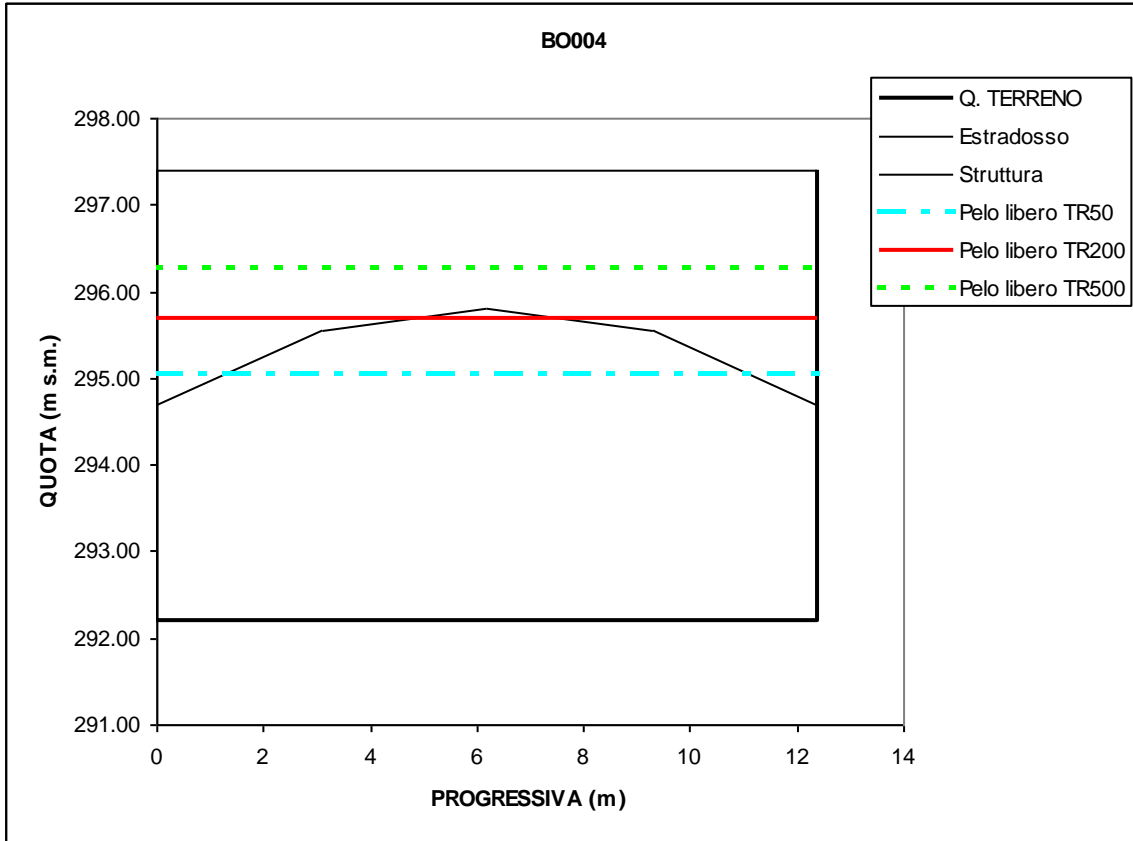


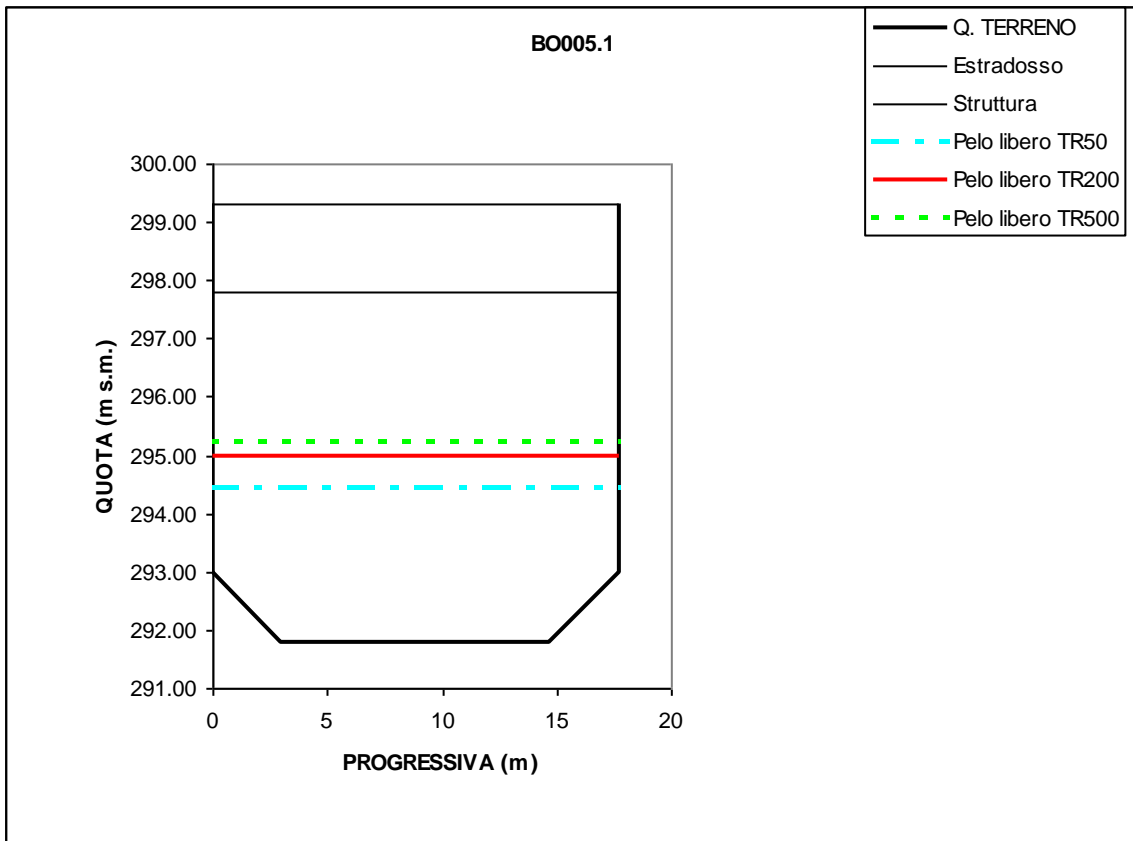
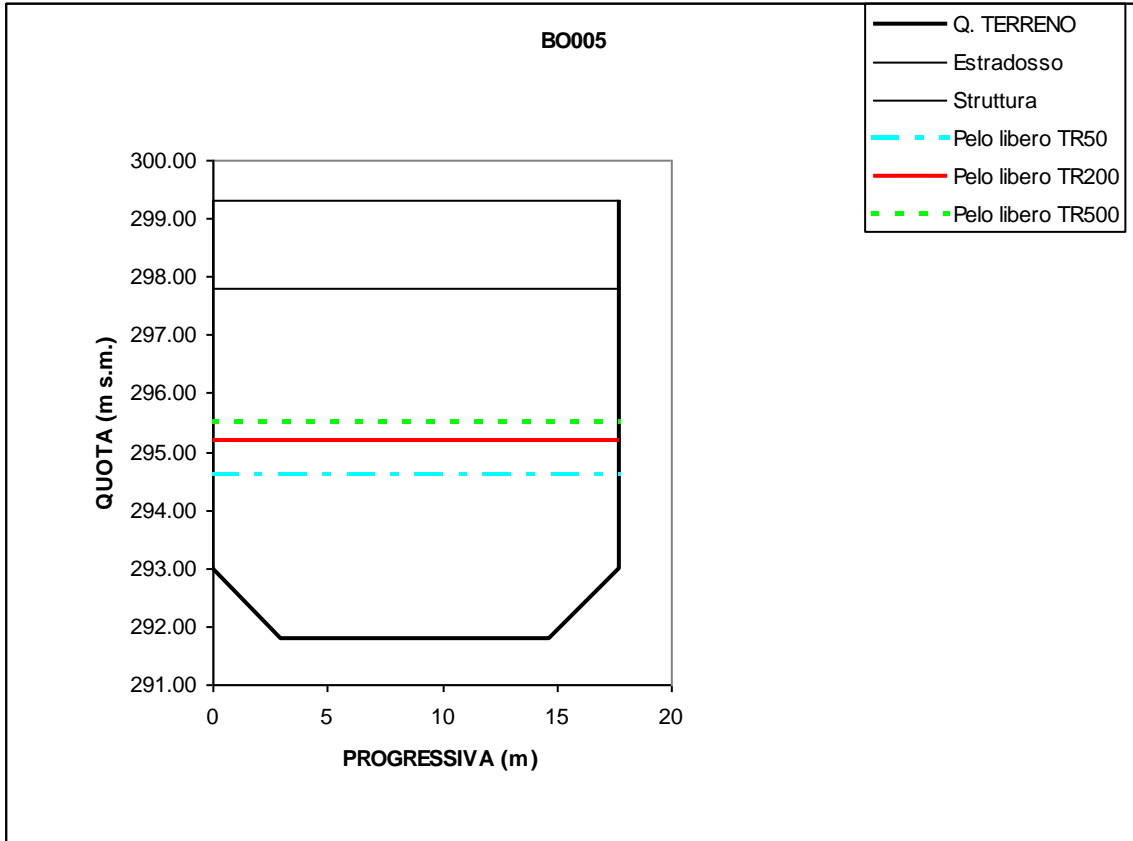
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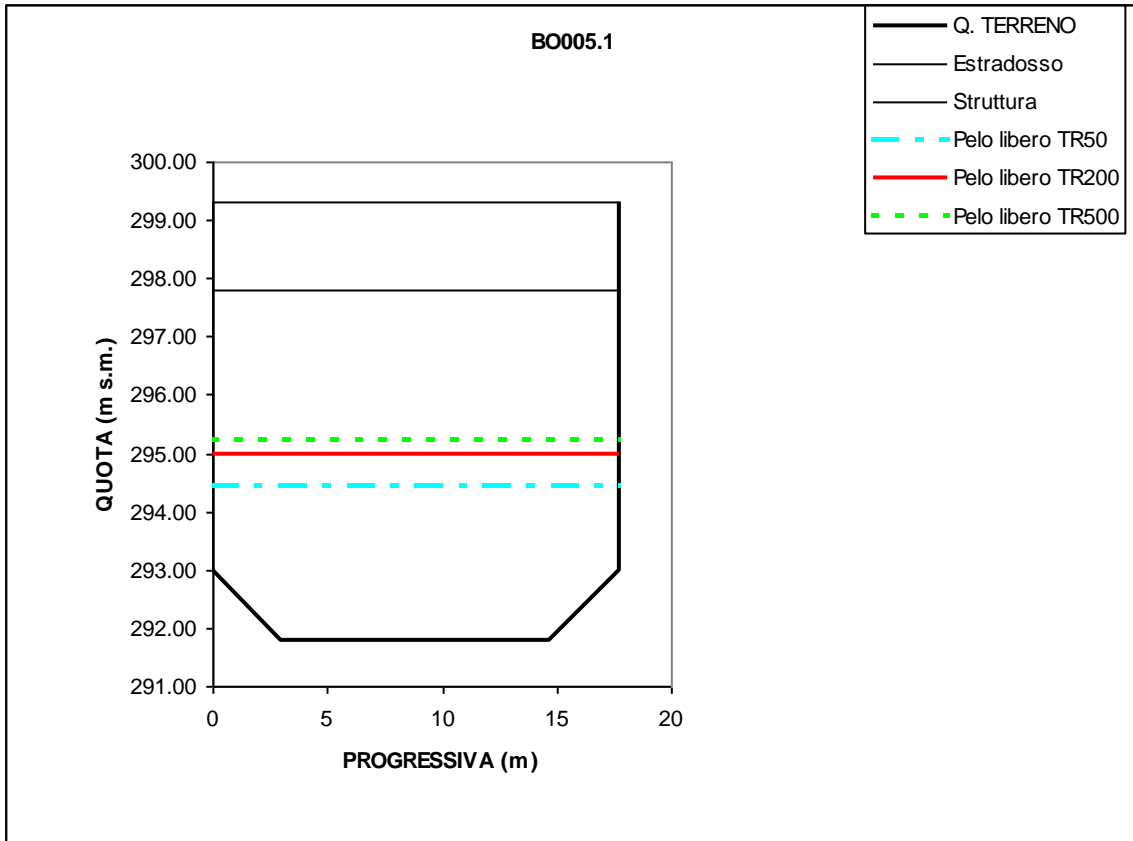
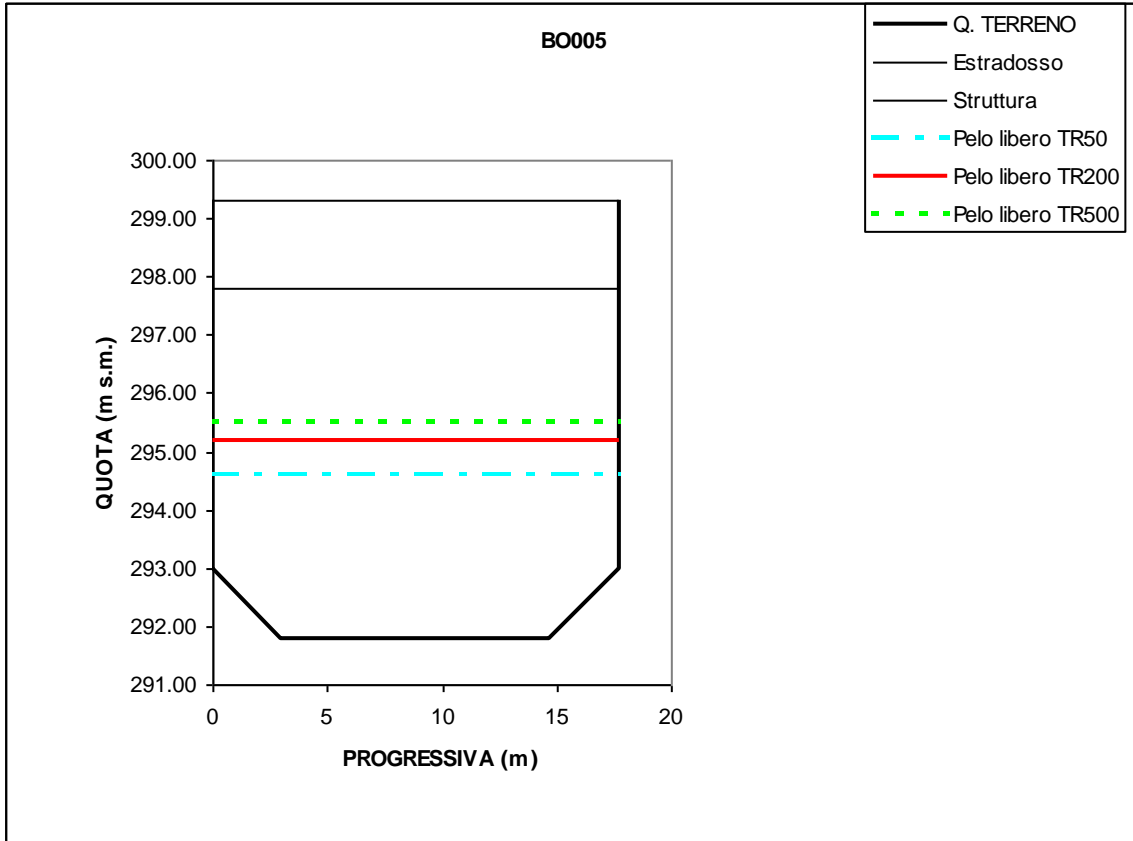


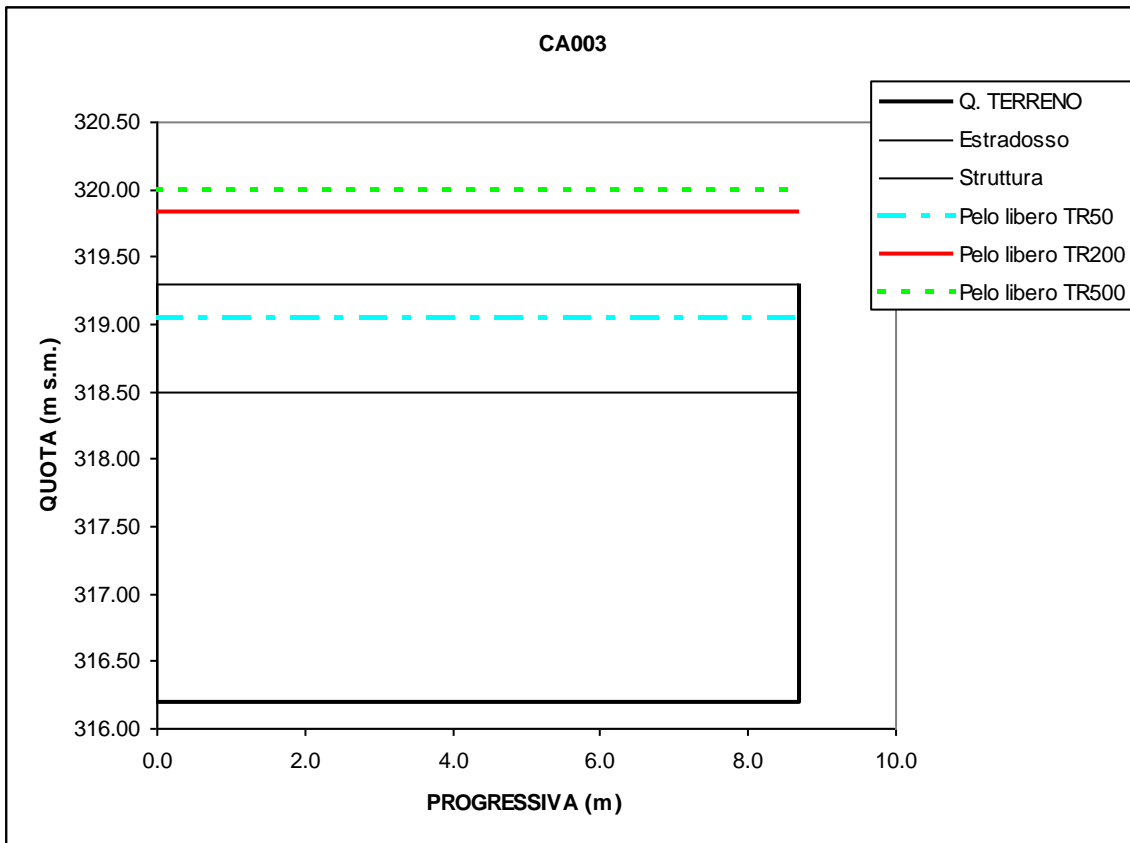
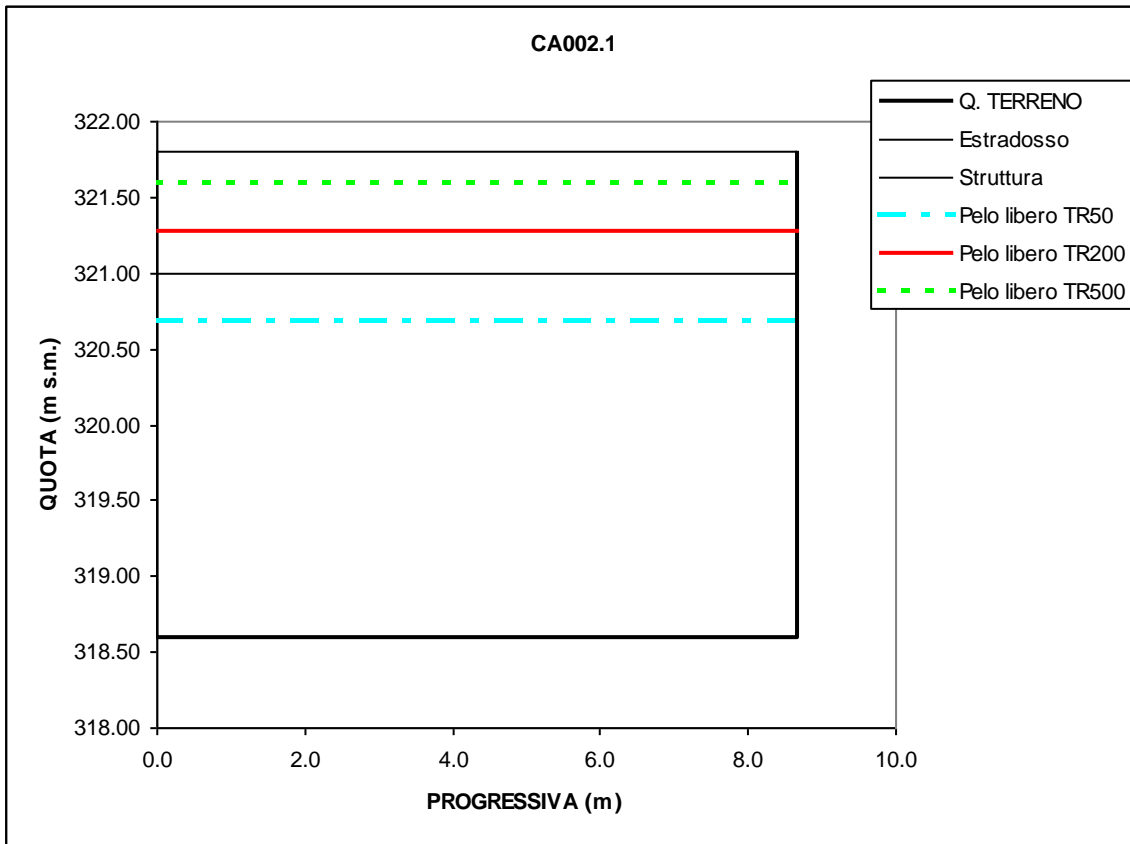


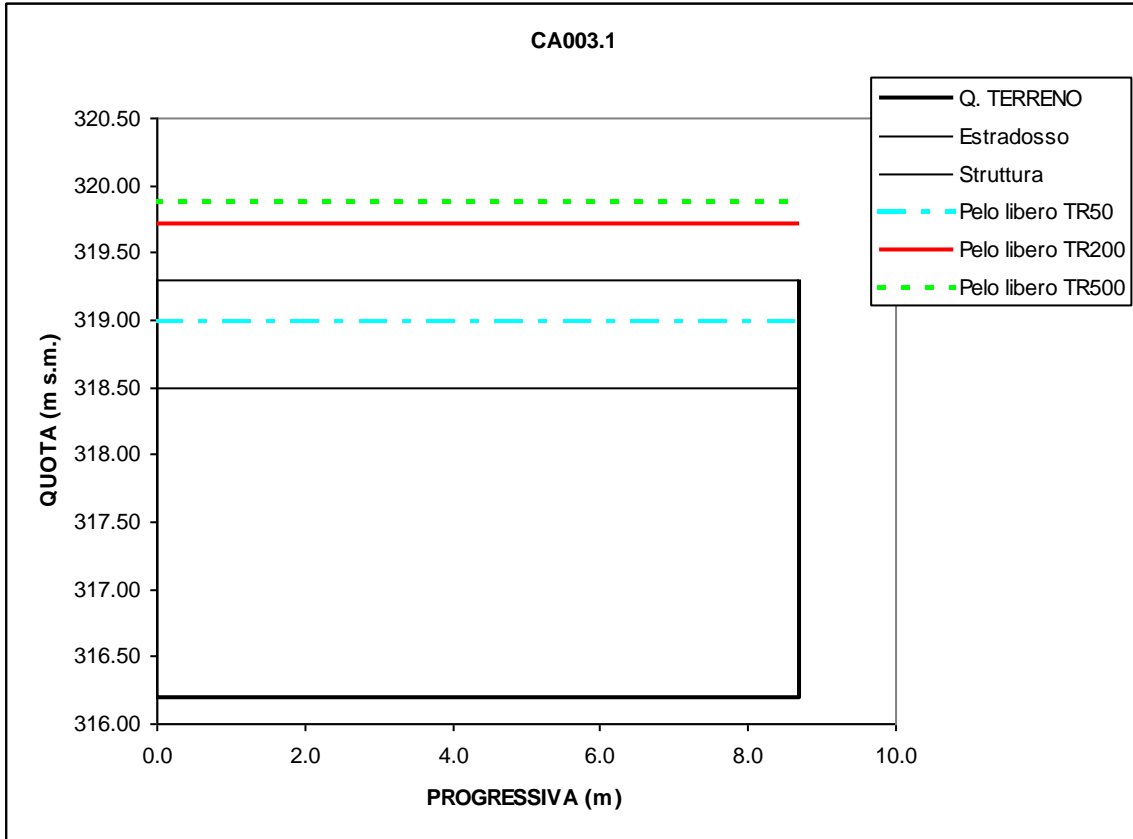




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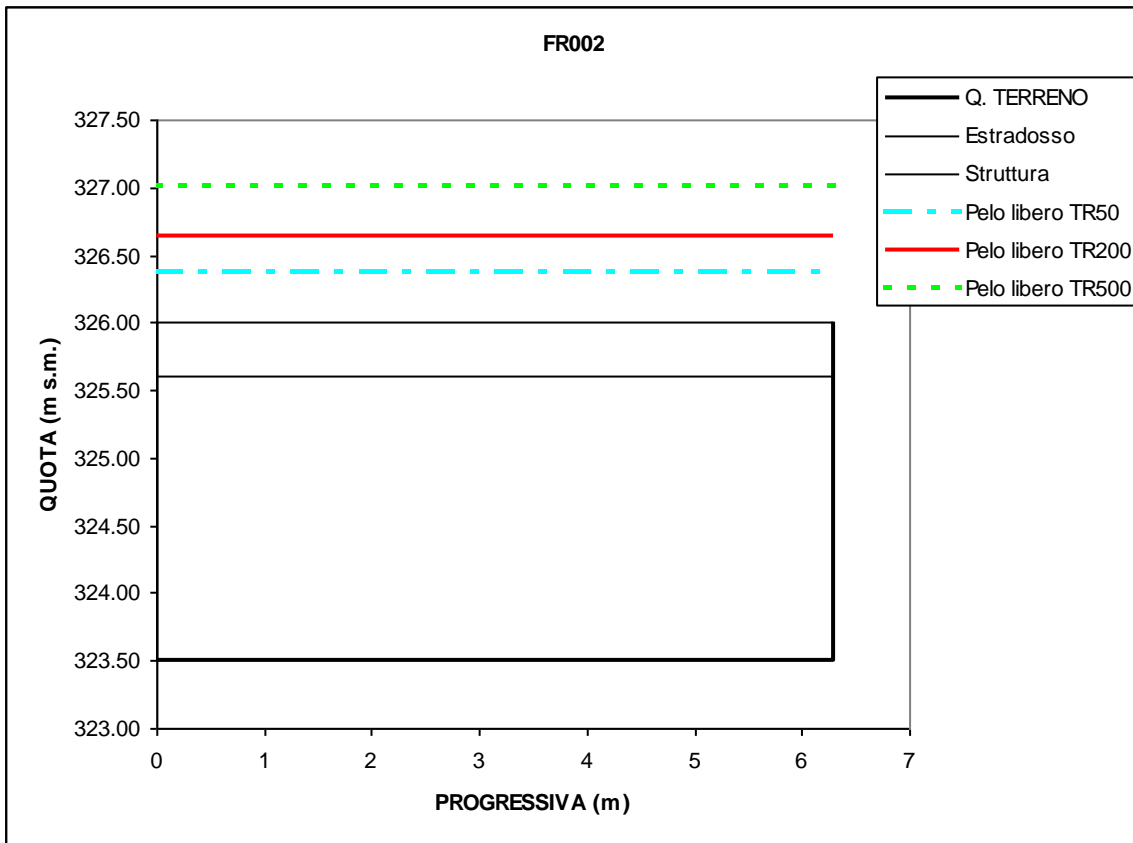
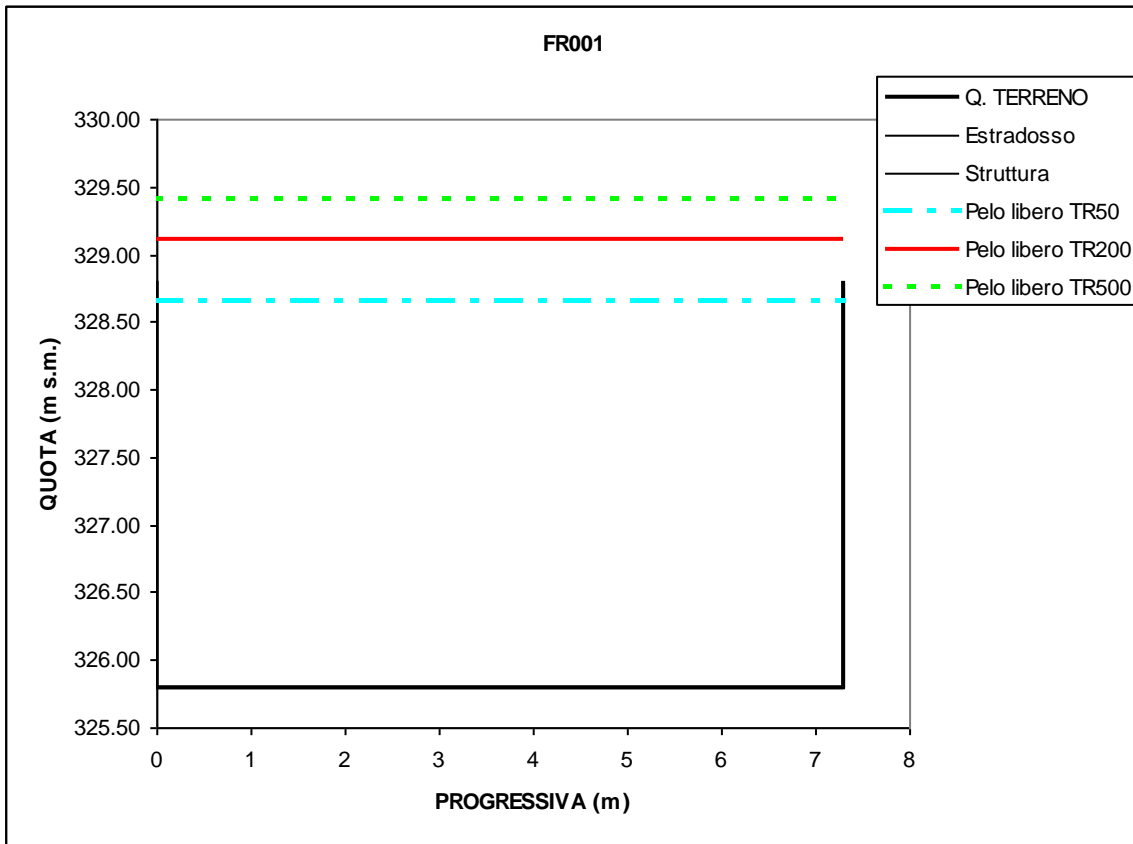


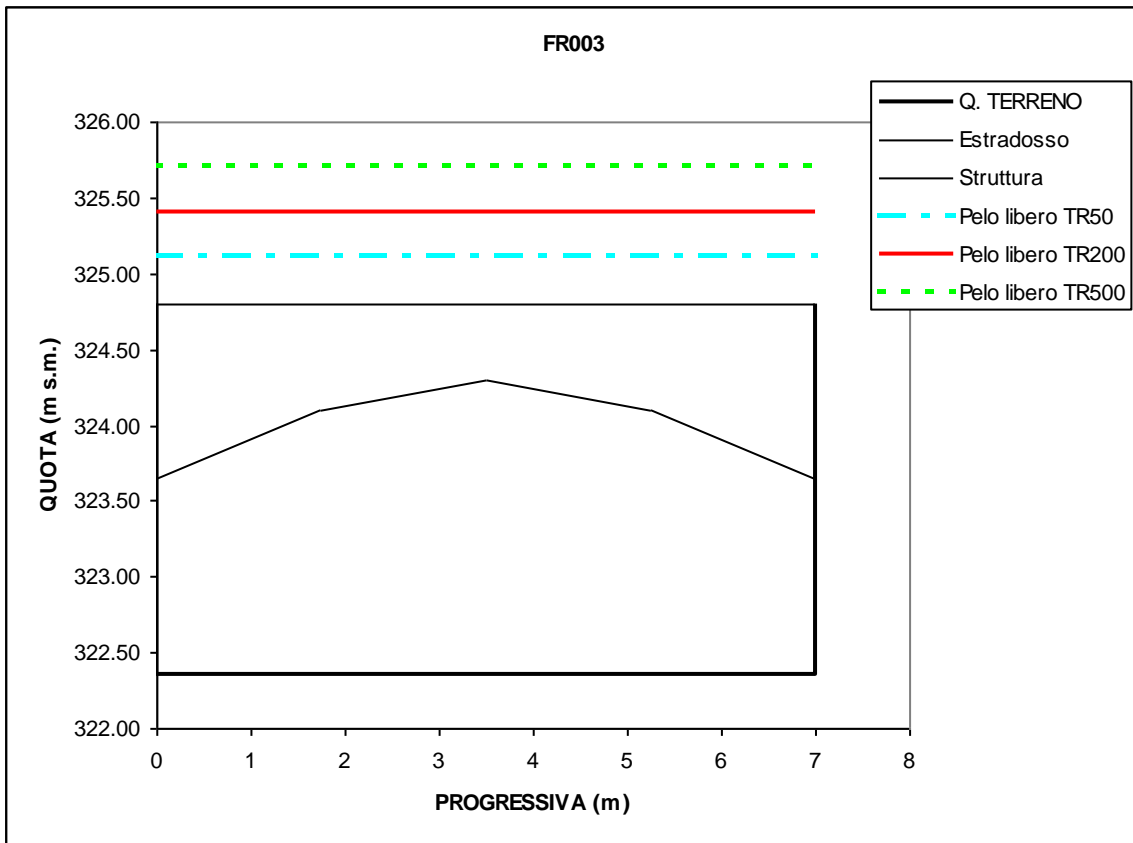
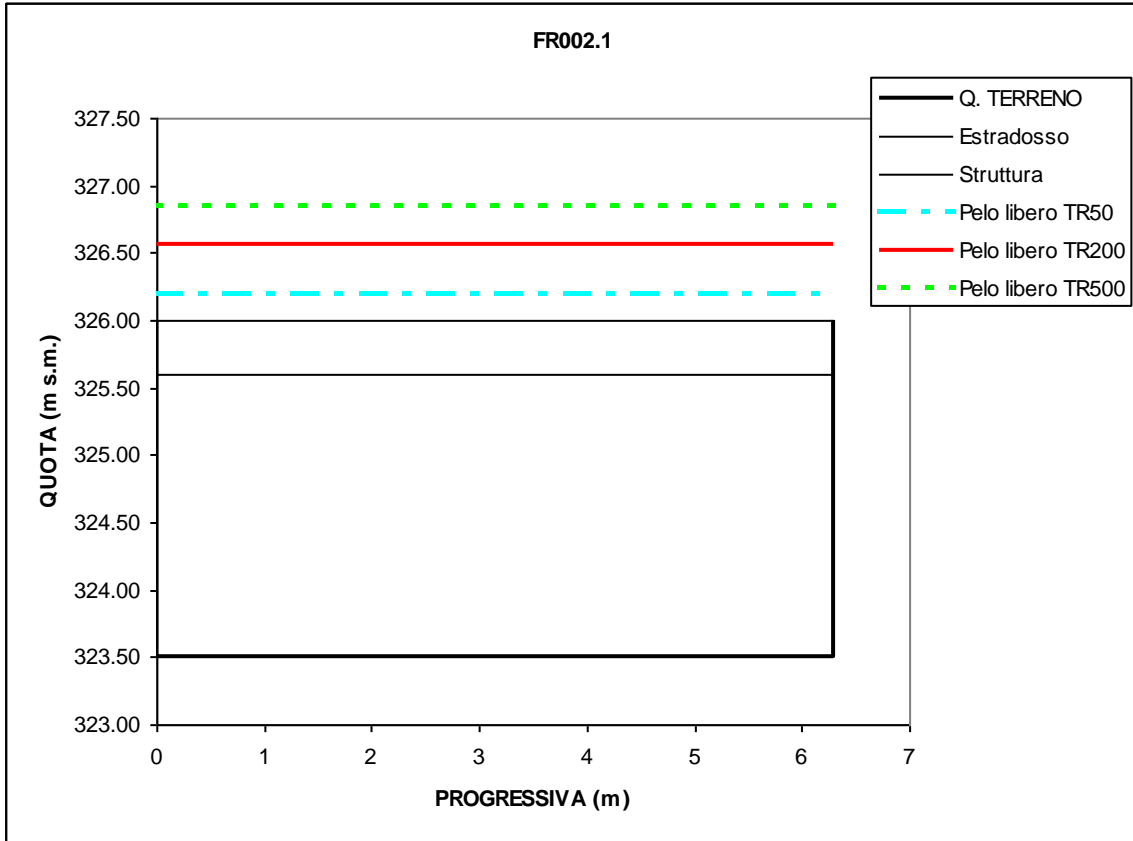


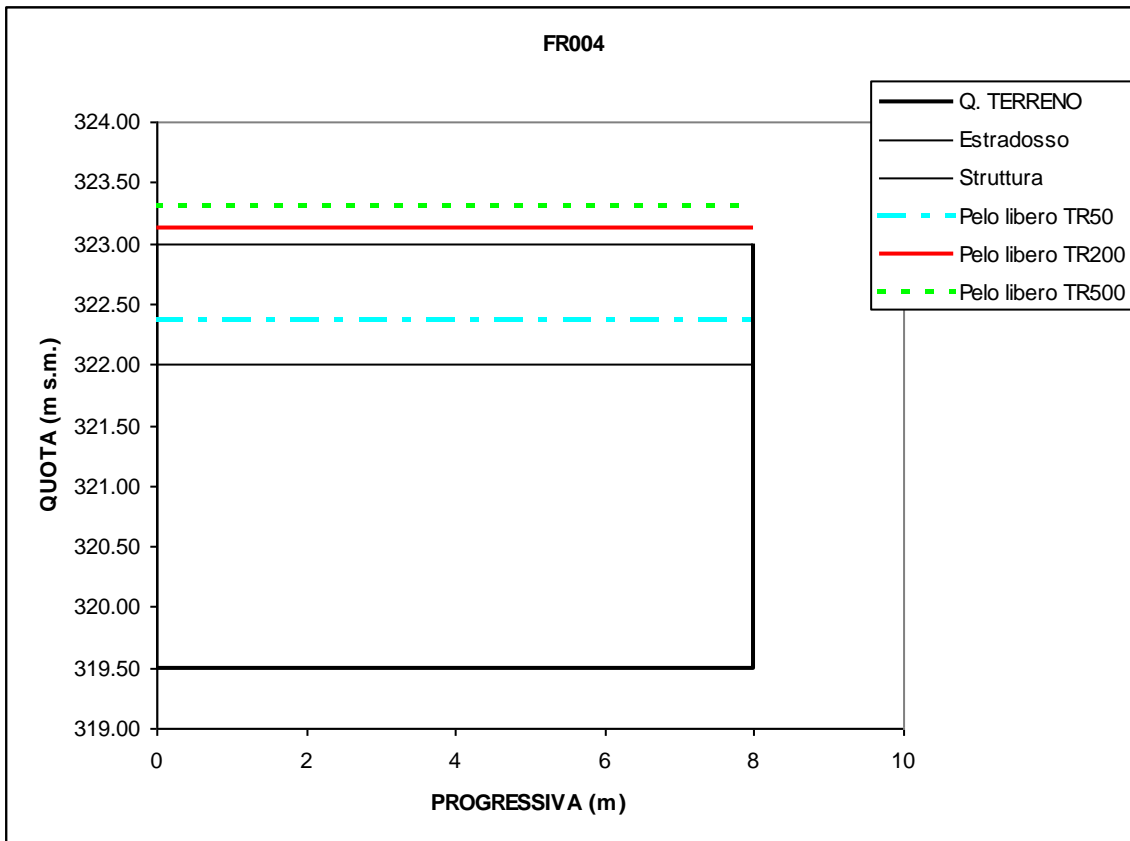
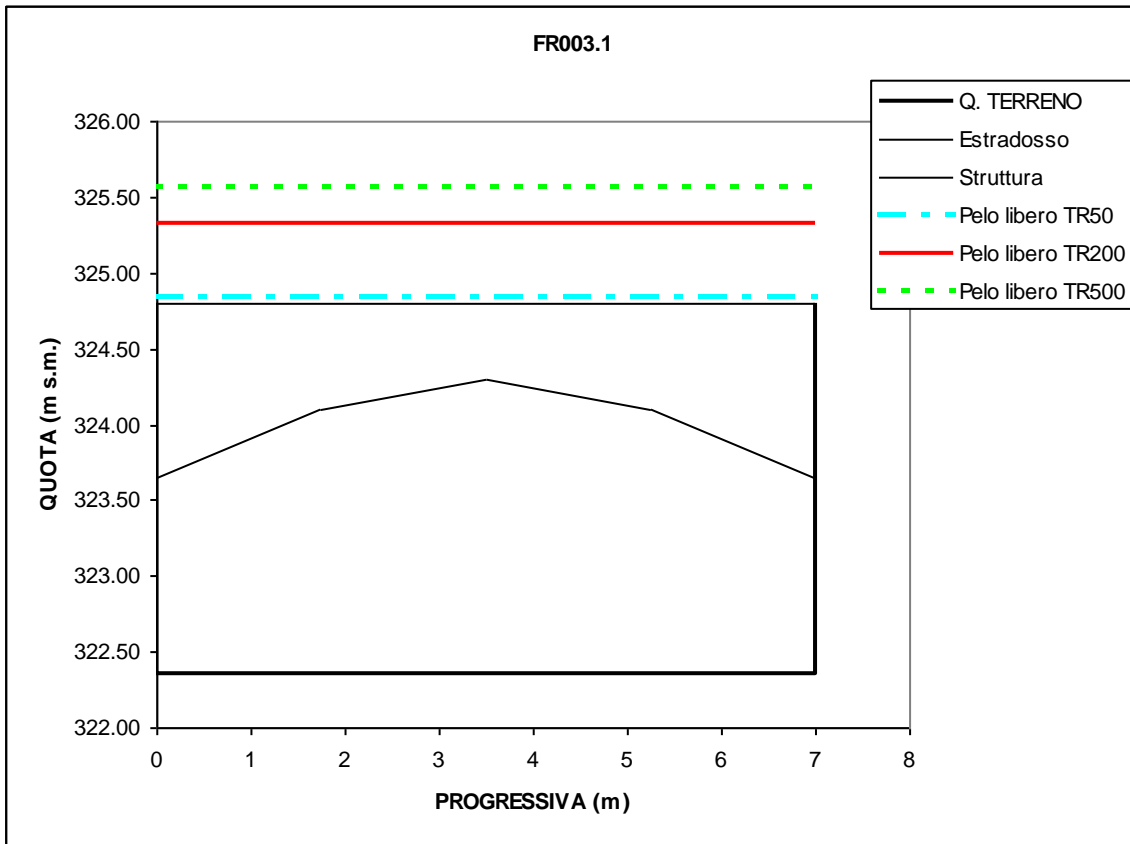


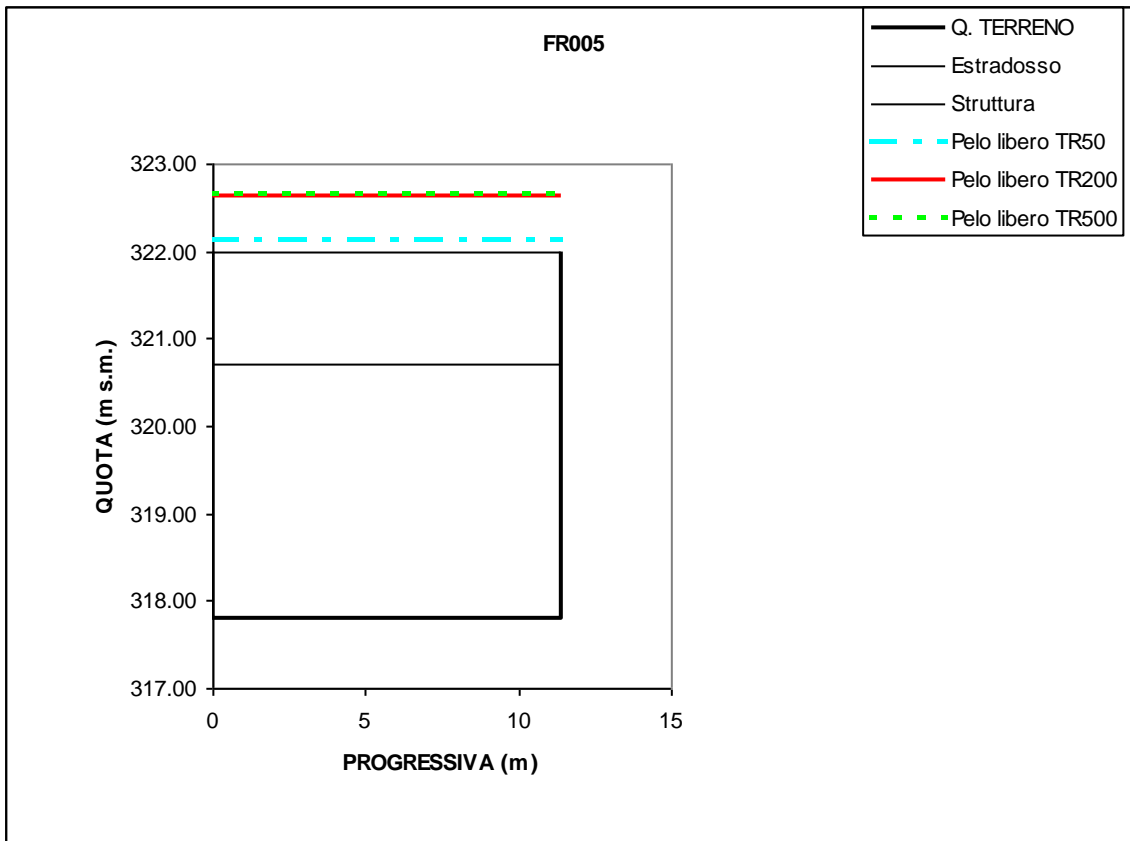
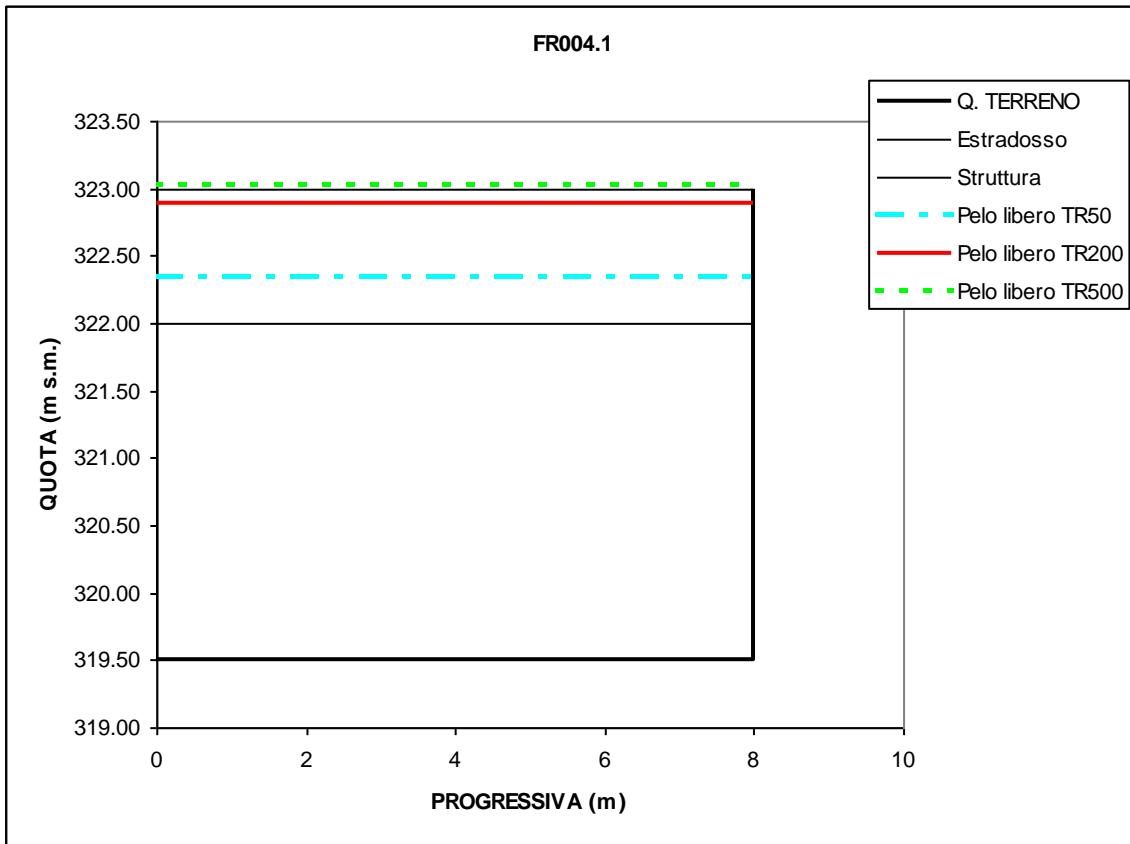


# RIO FRASSINO

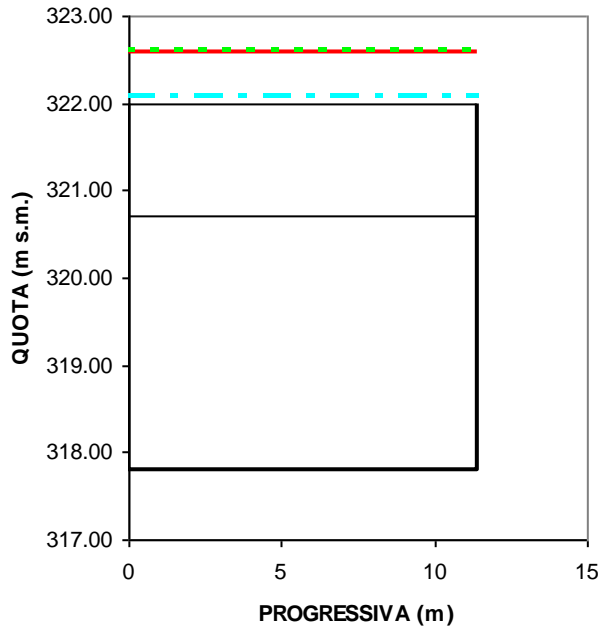






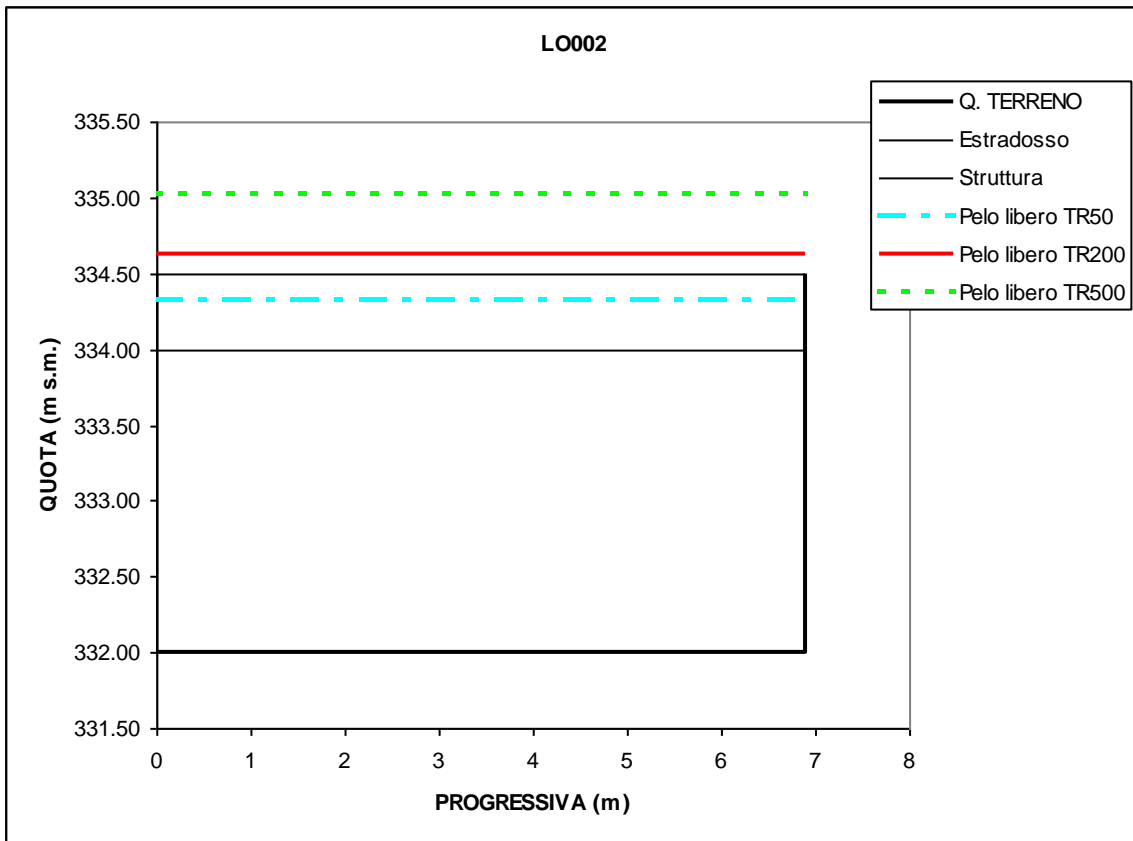
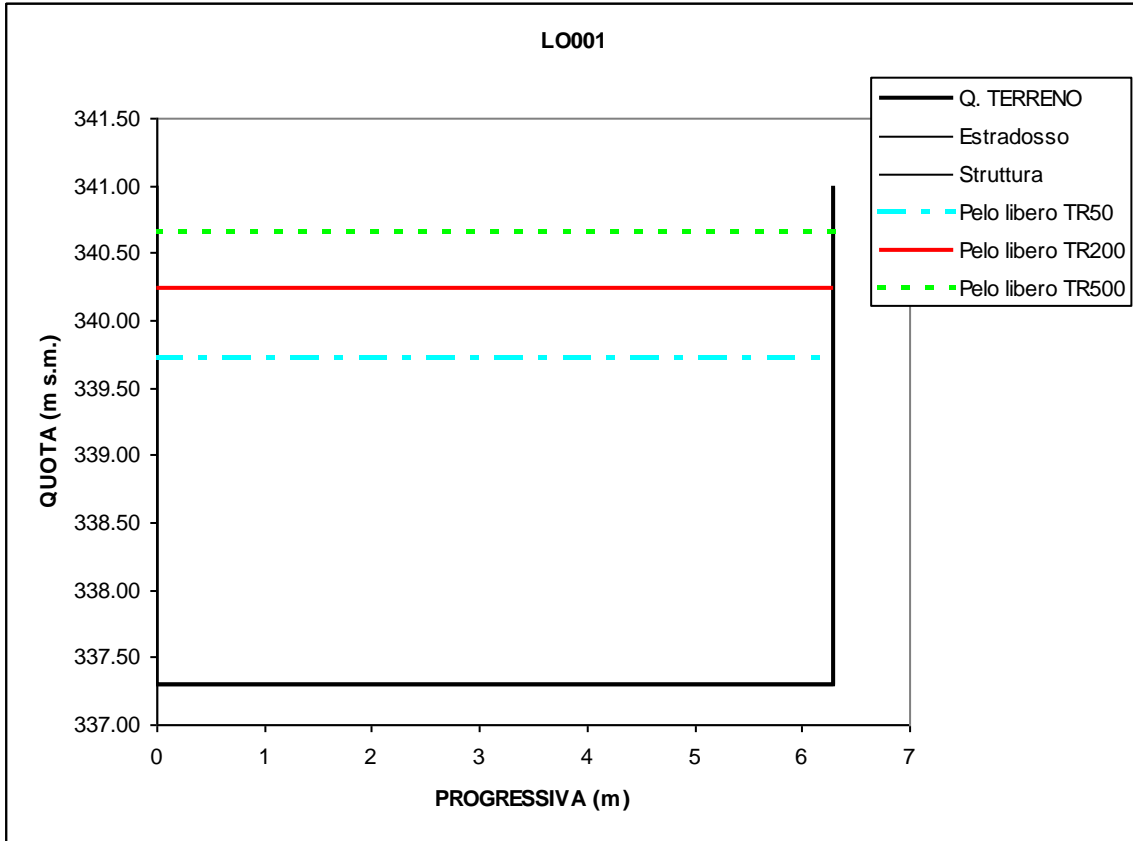


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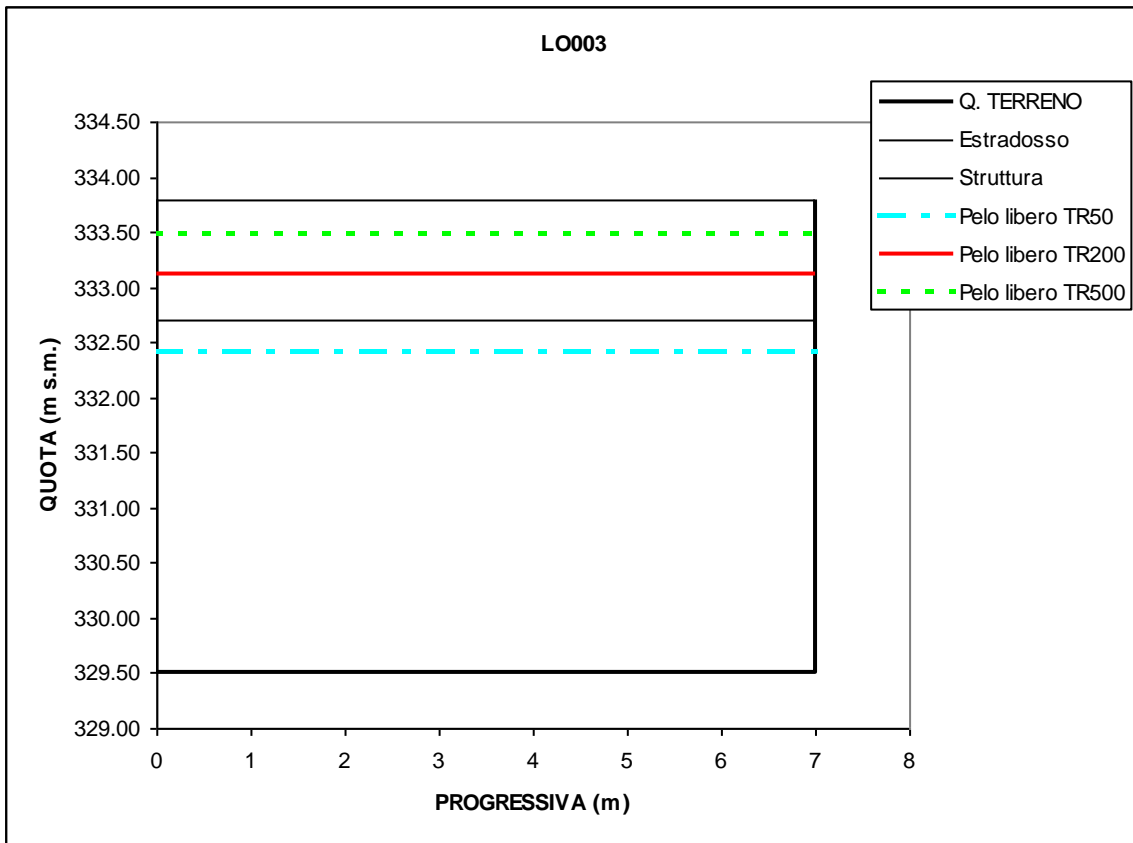
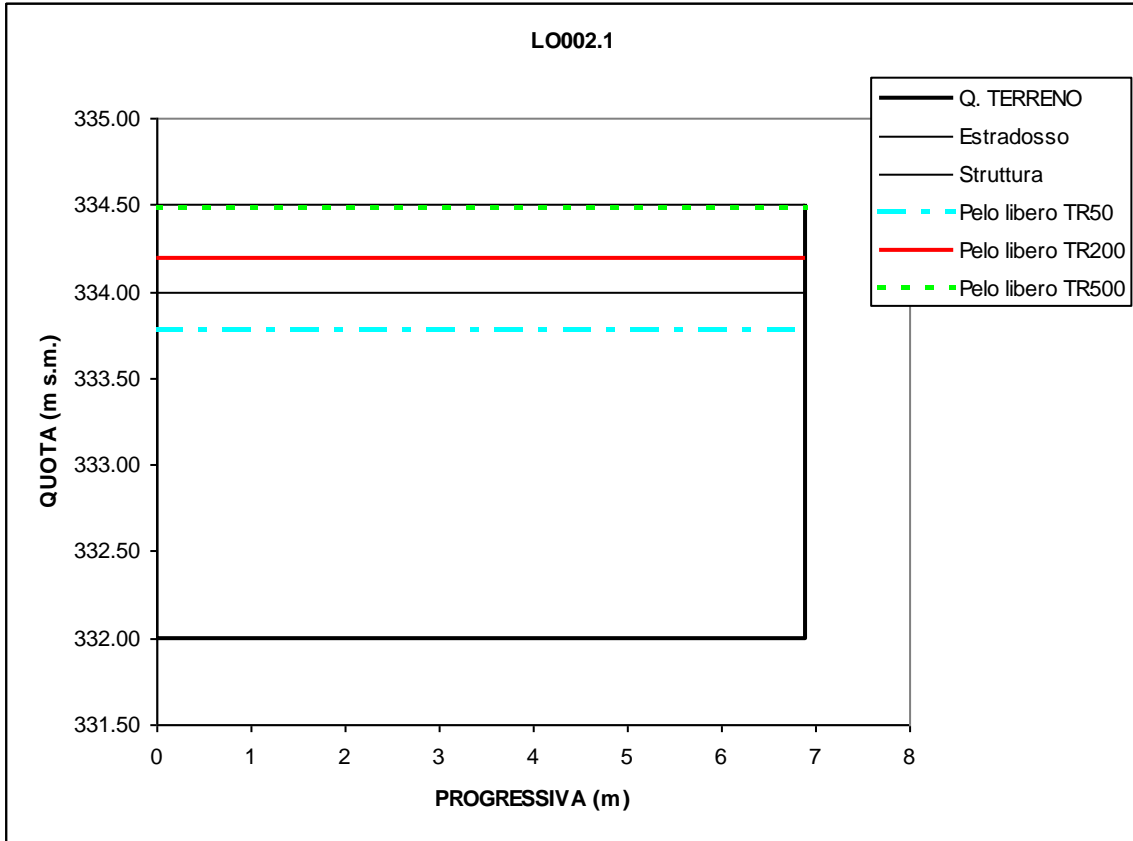


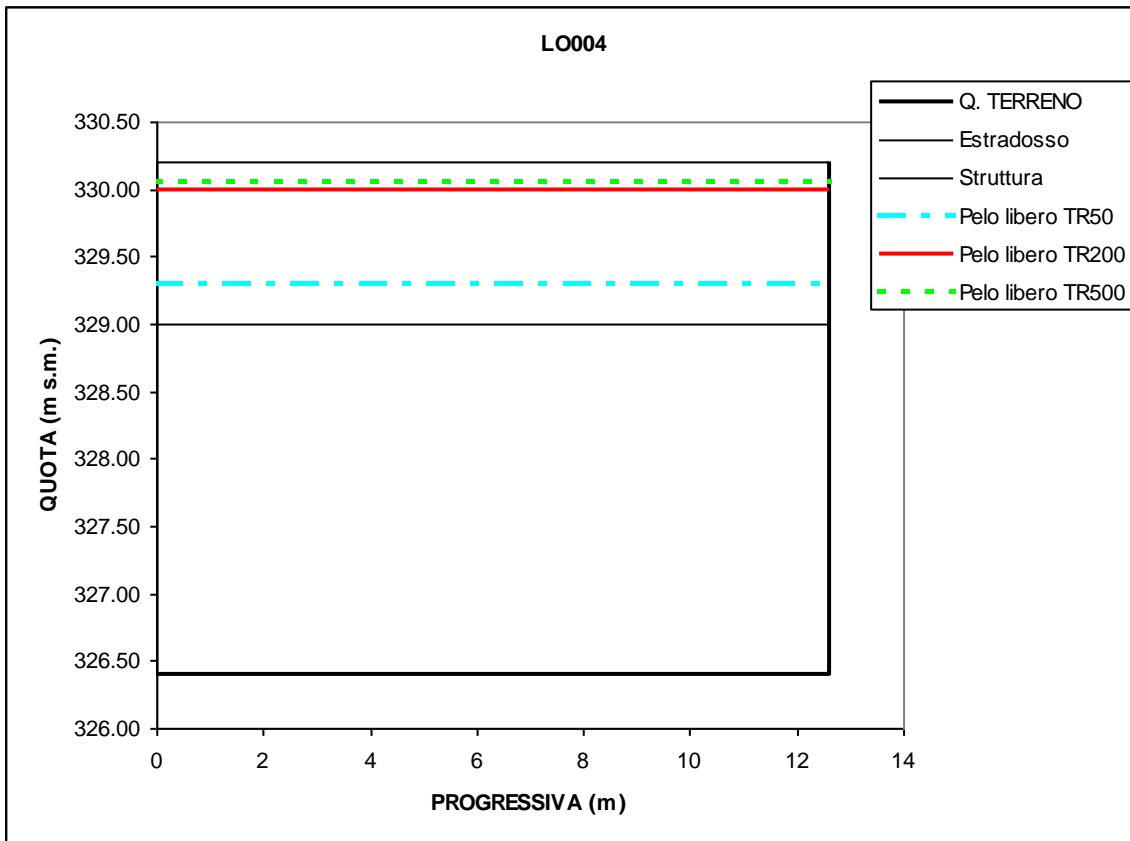
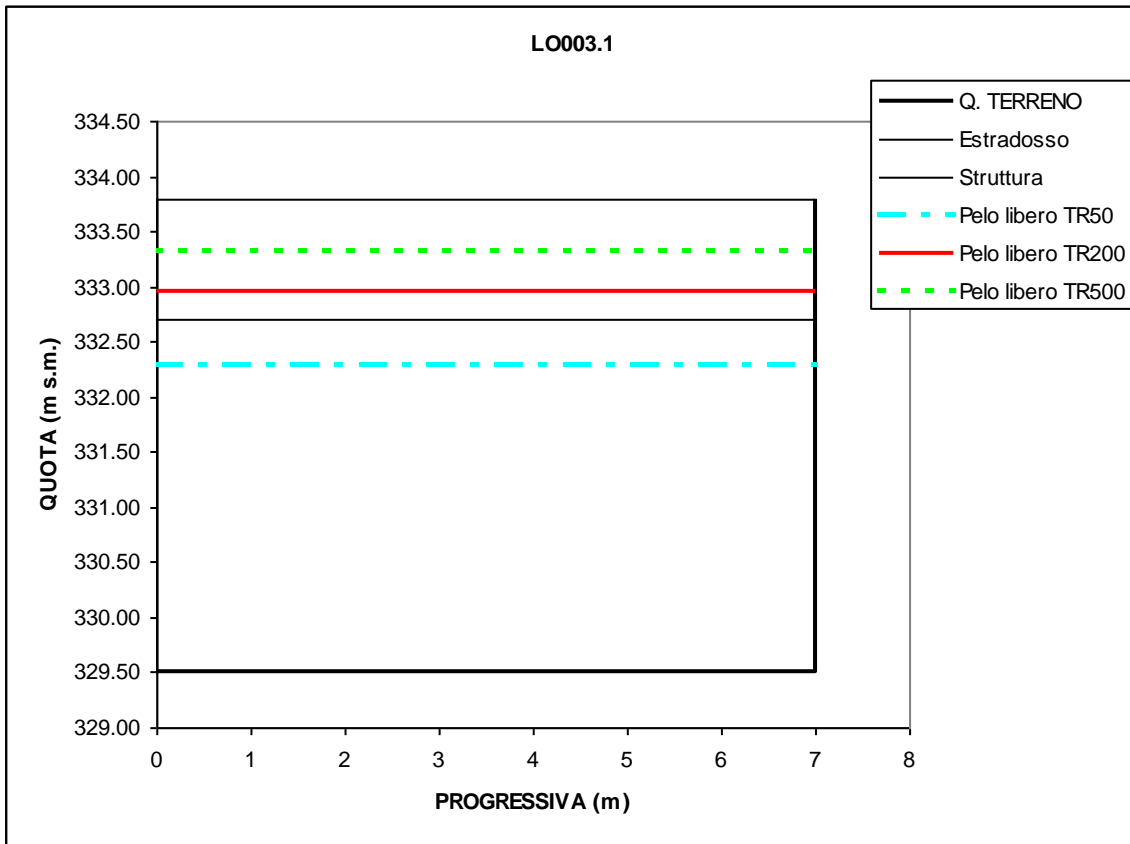
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- Estradosso
- Struttura
- - - Pelo libero TR50
- Pelo libero TR200
- - - Pelo libero TR500

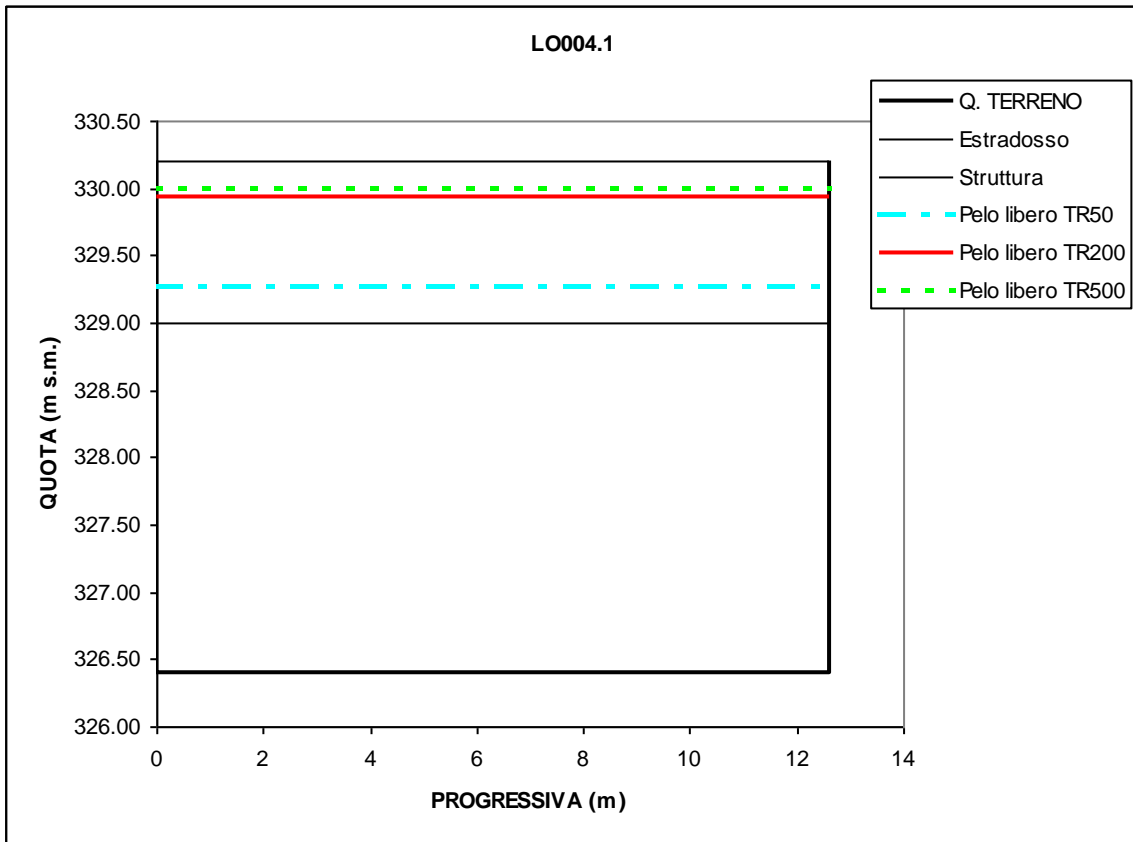
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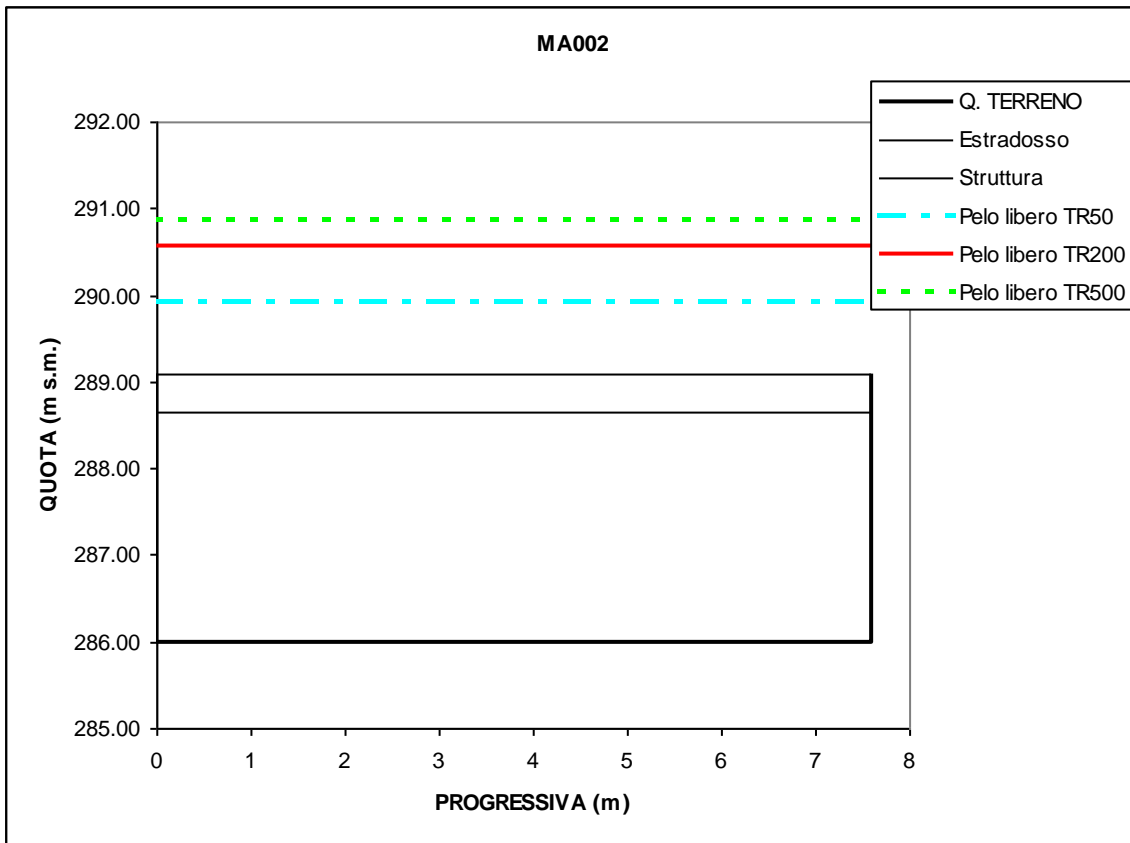
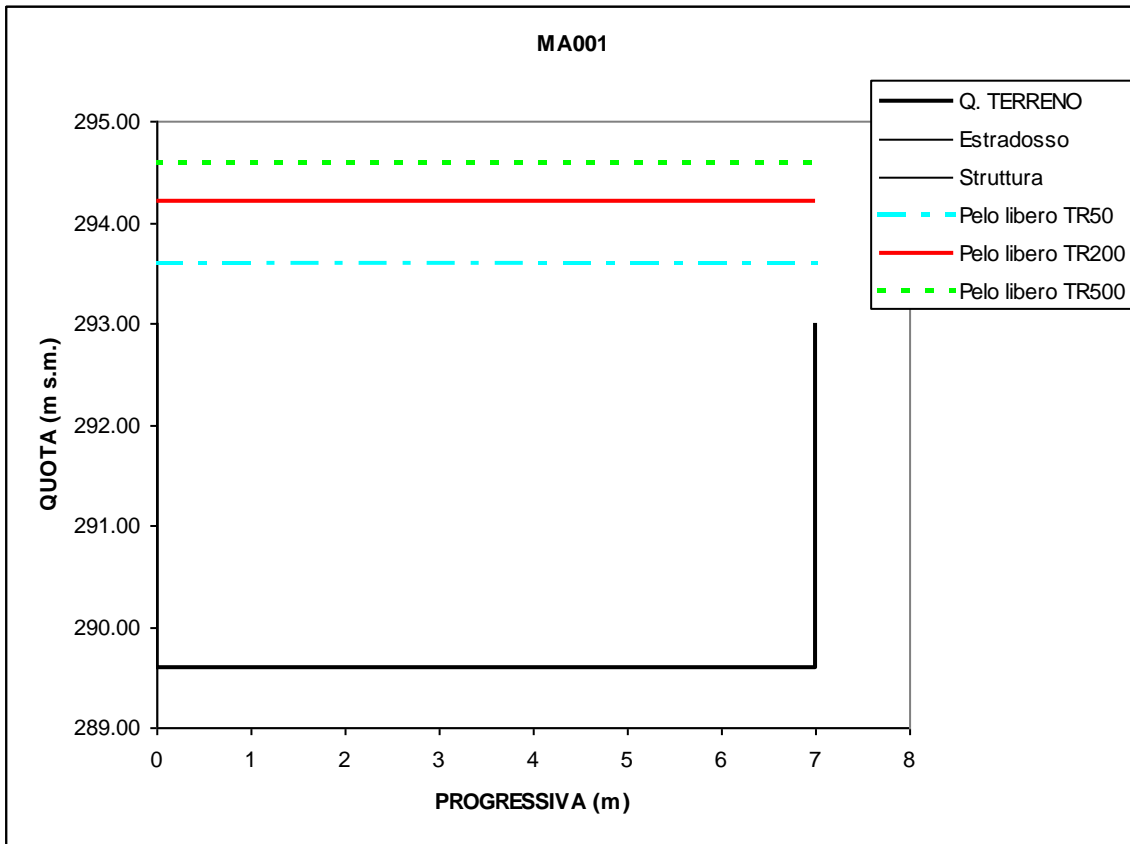


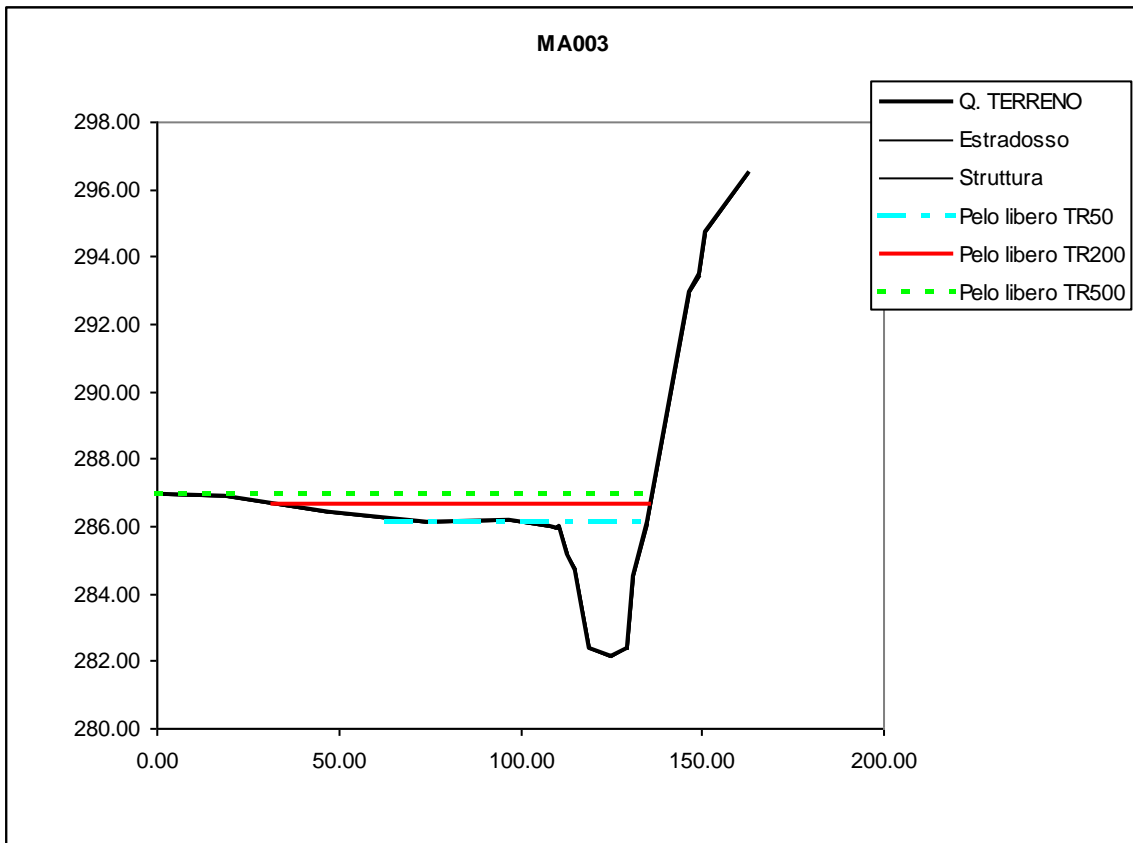
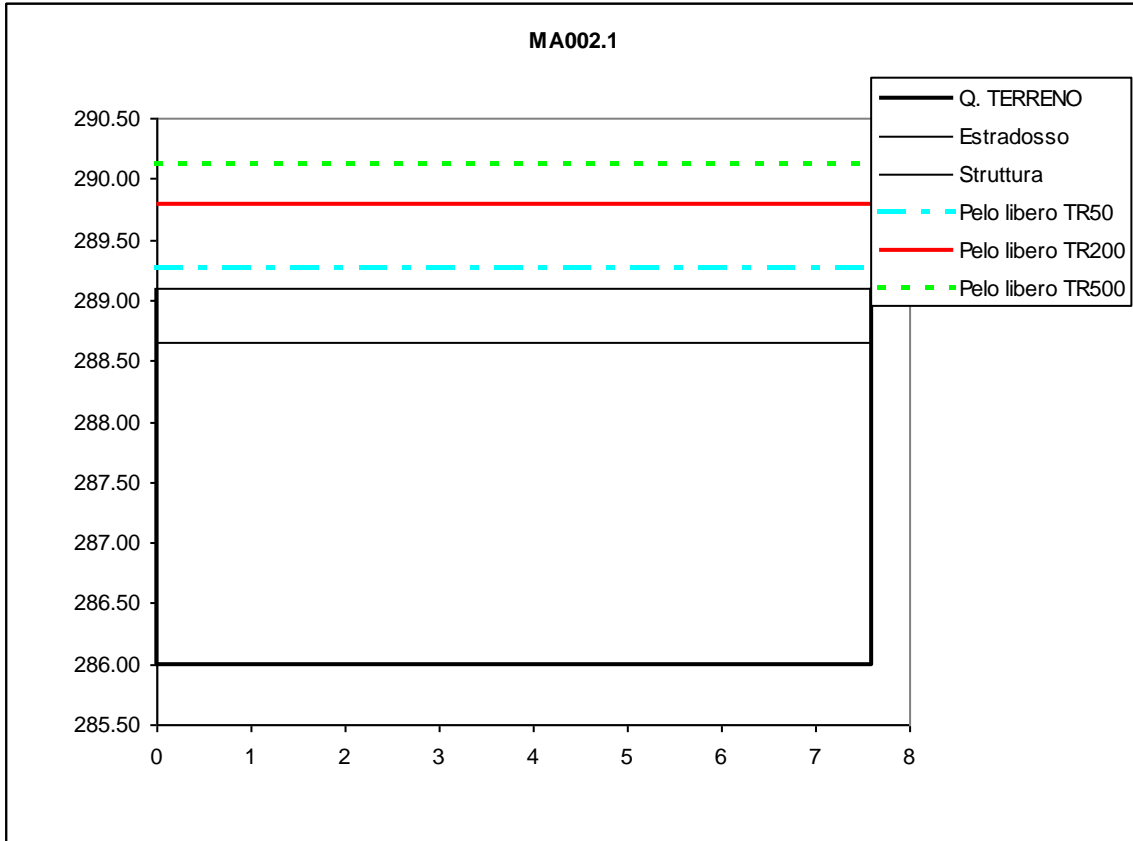


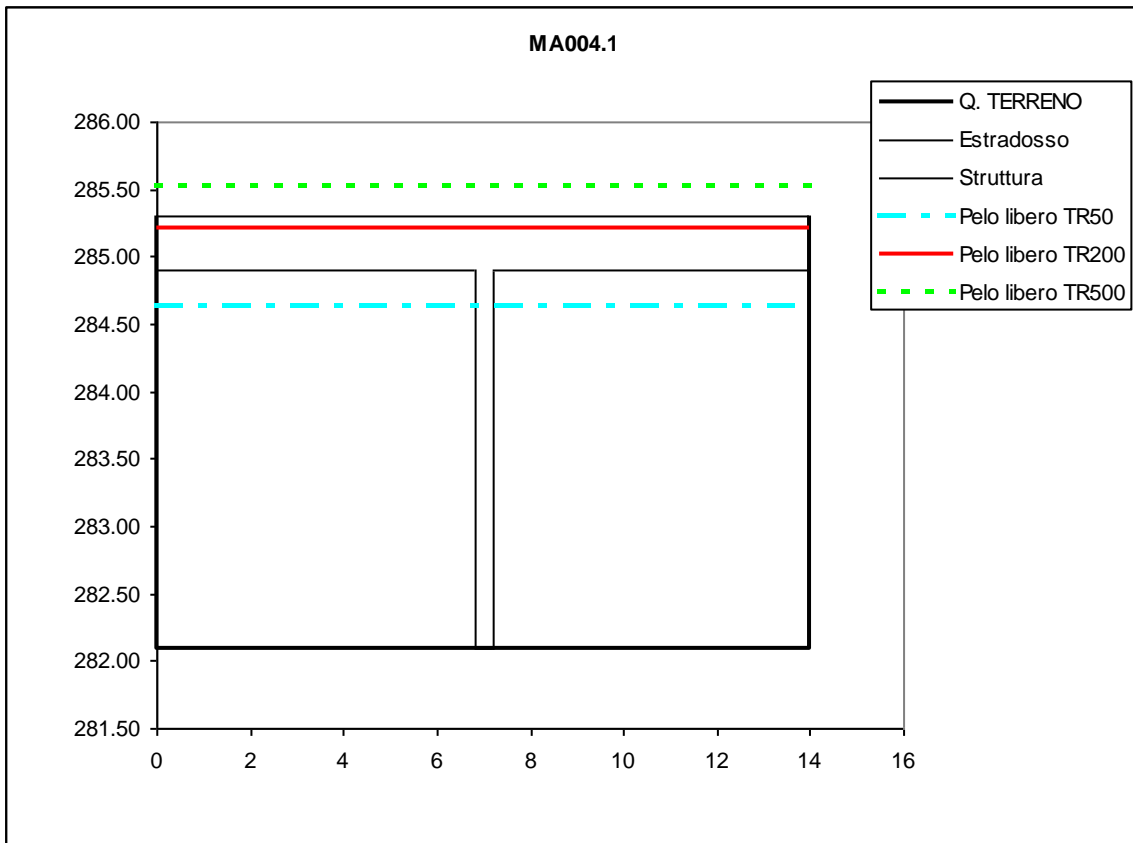
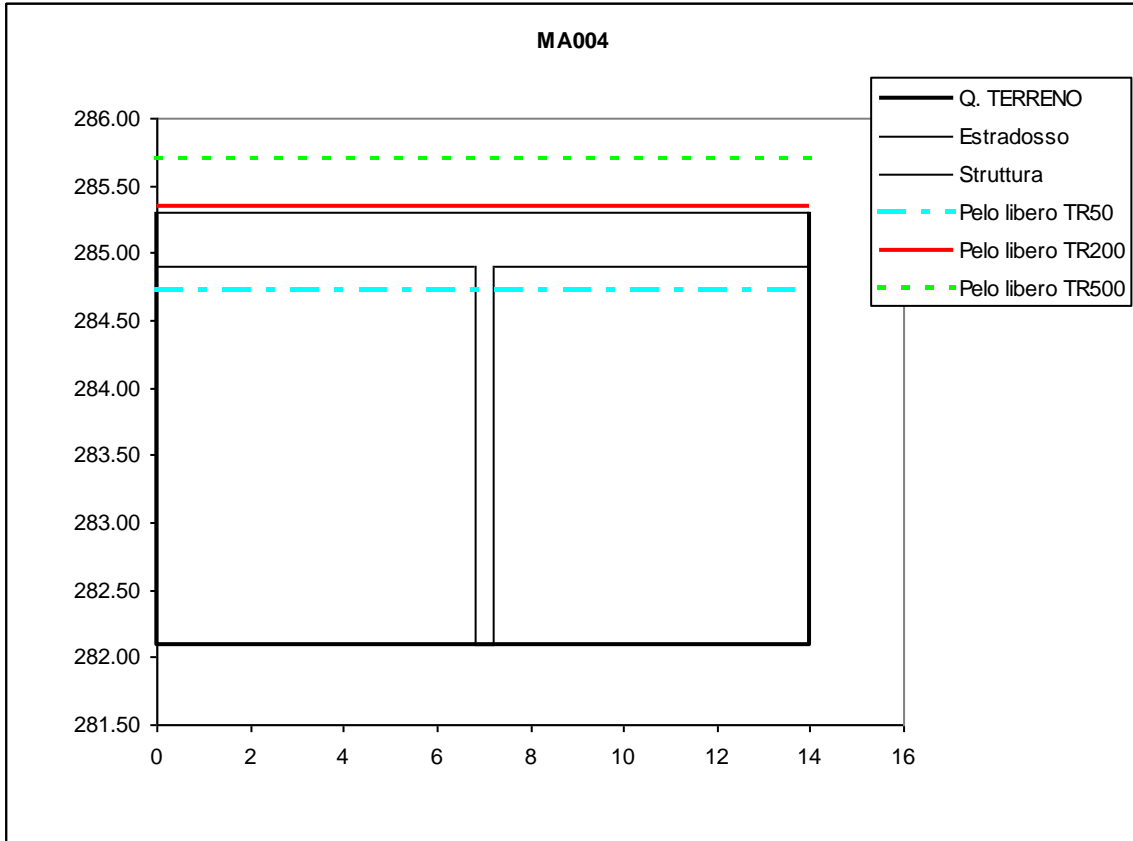


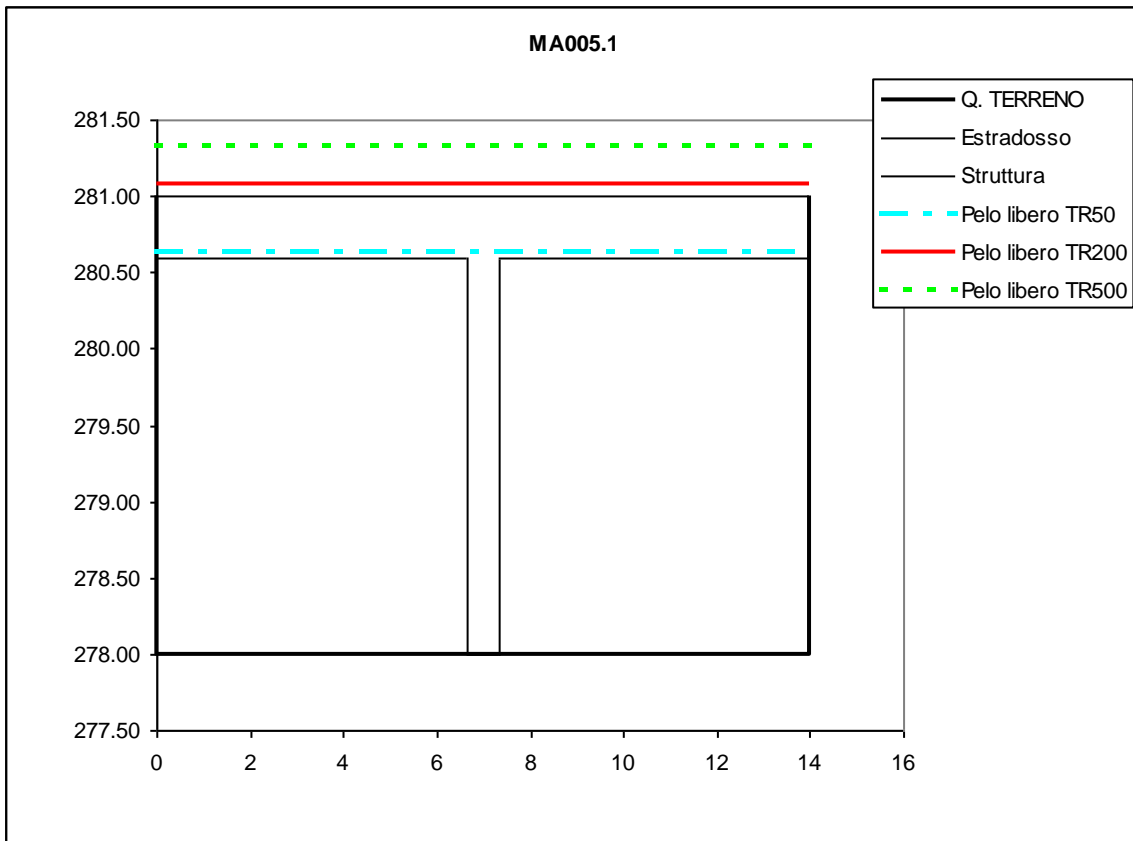
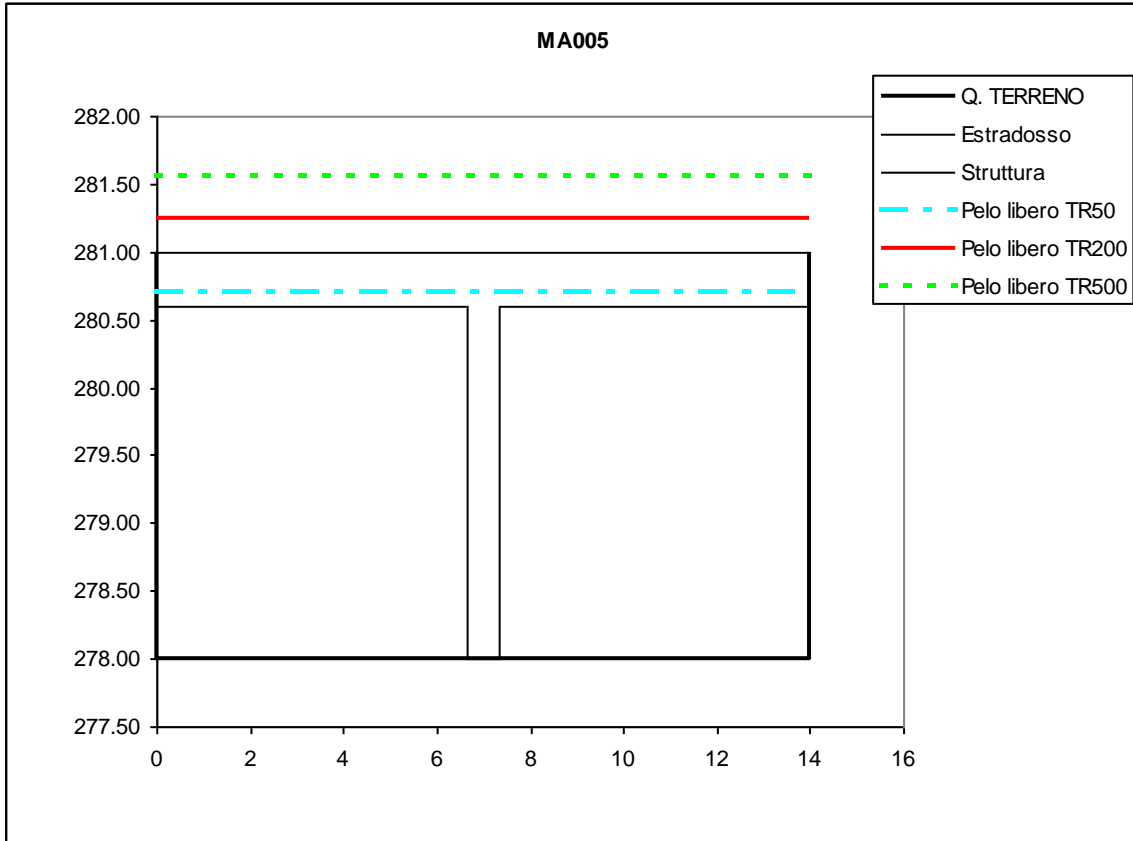


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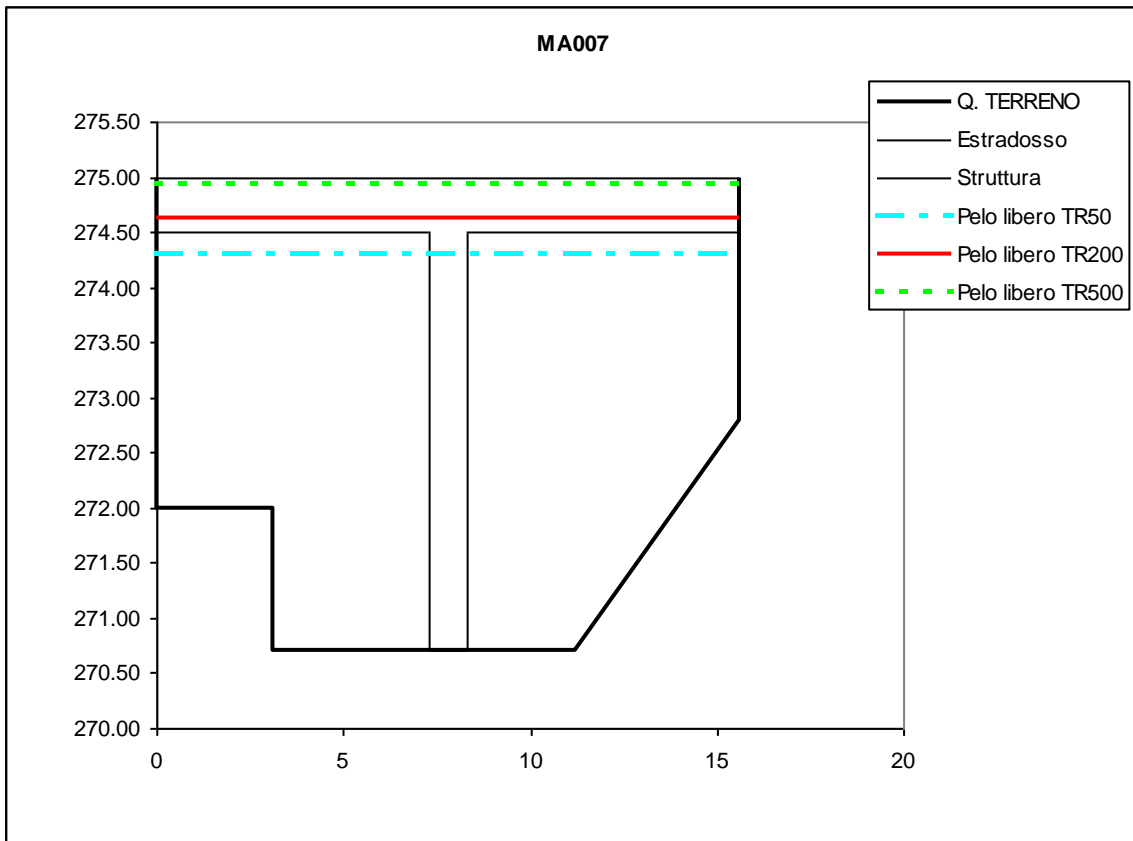
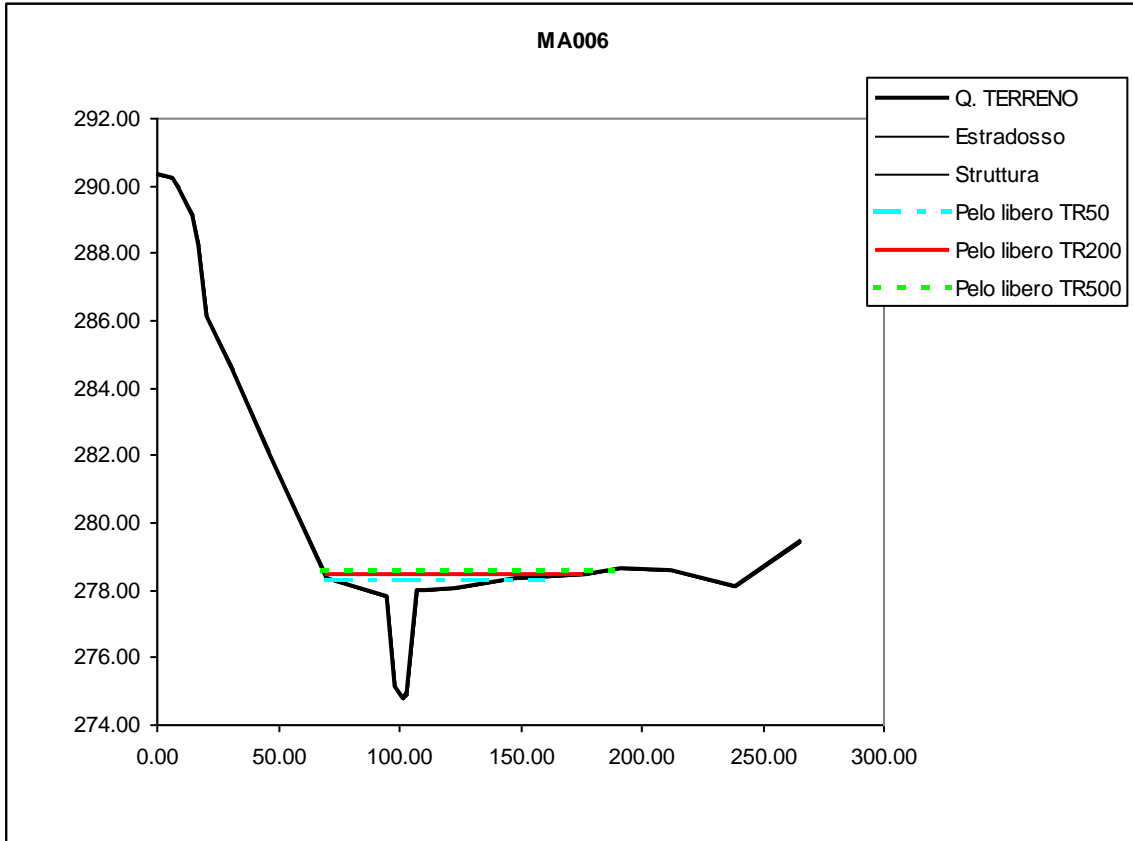


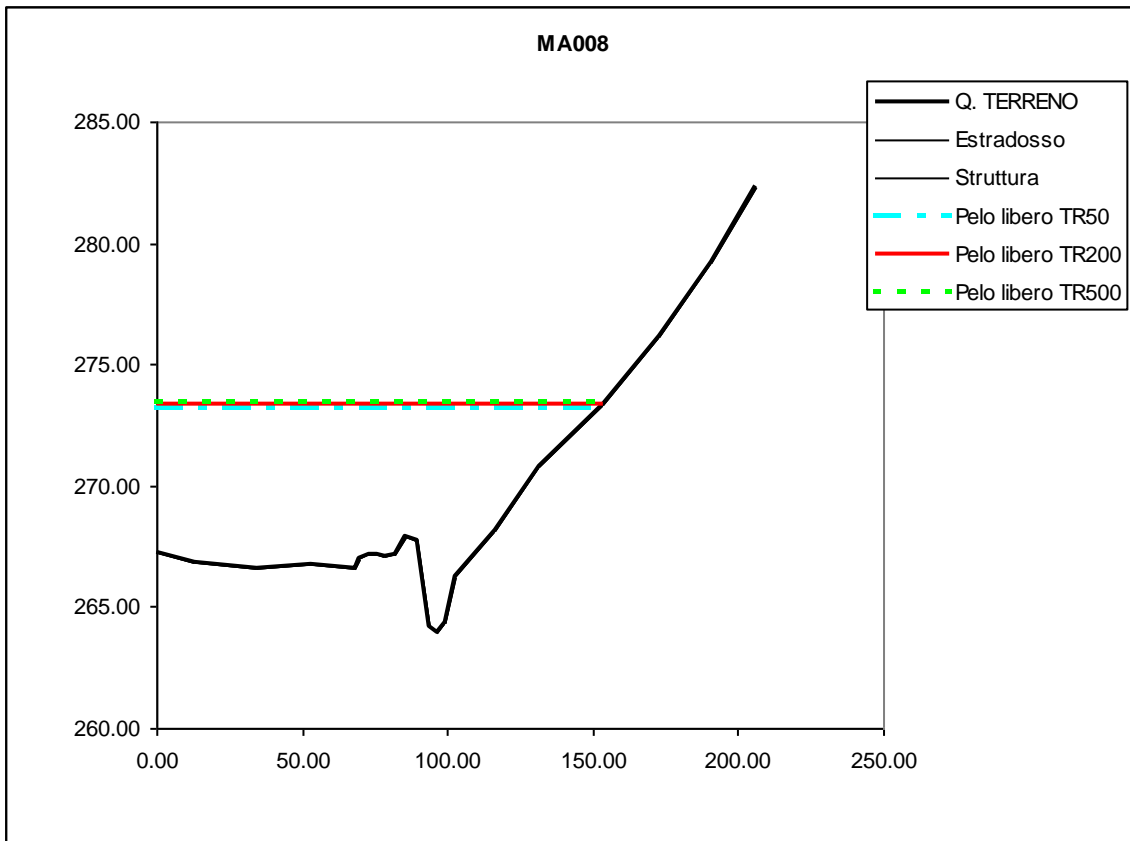
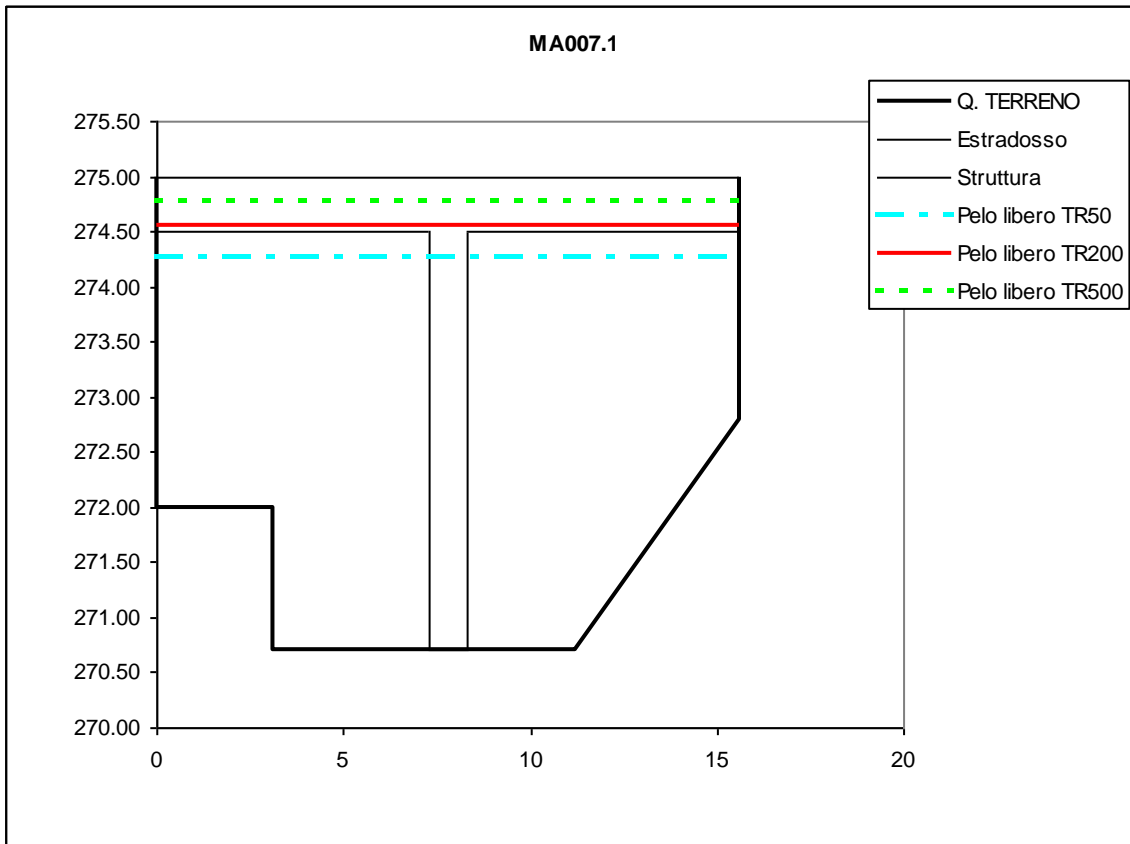


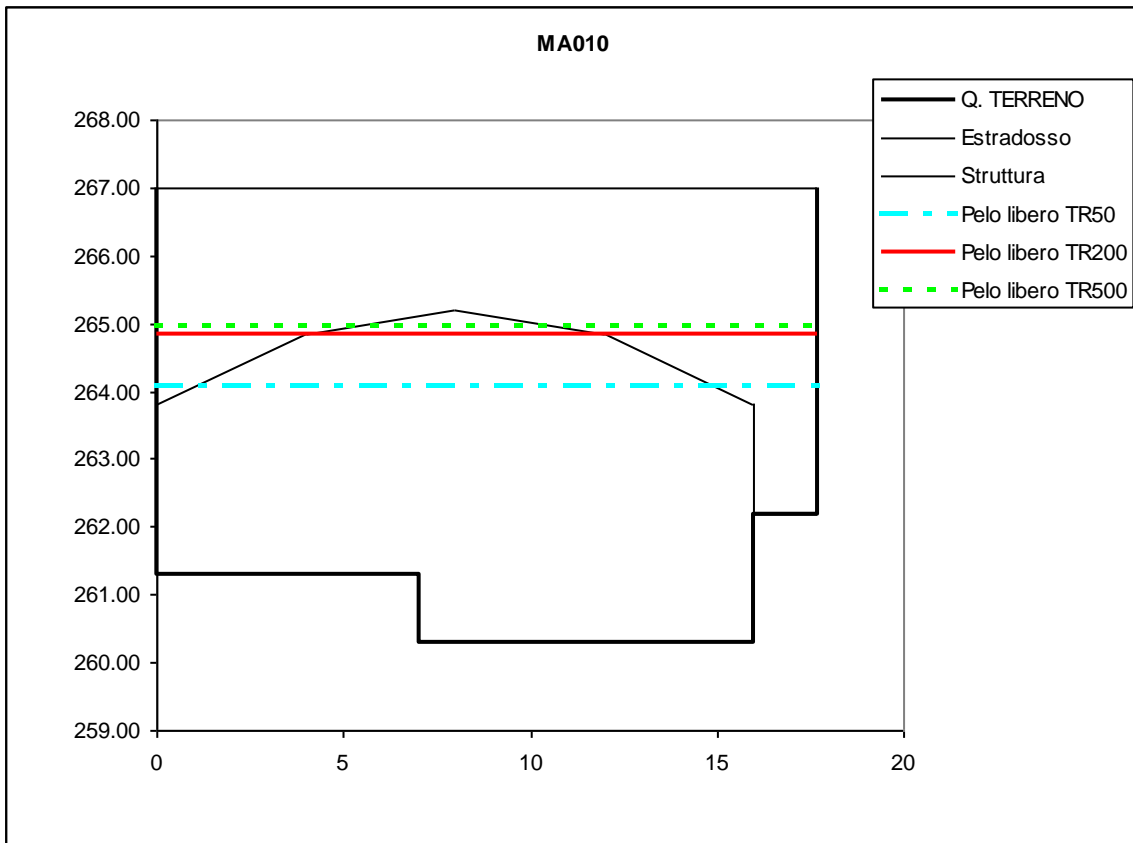
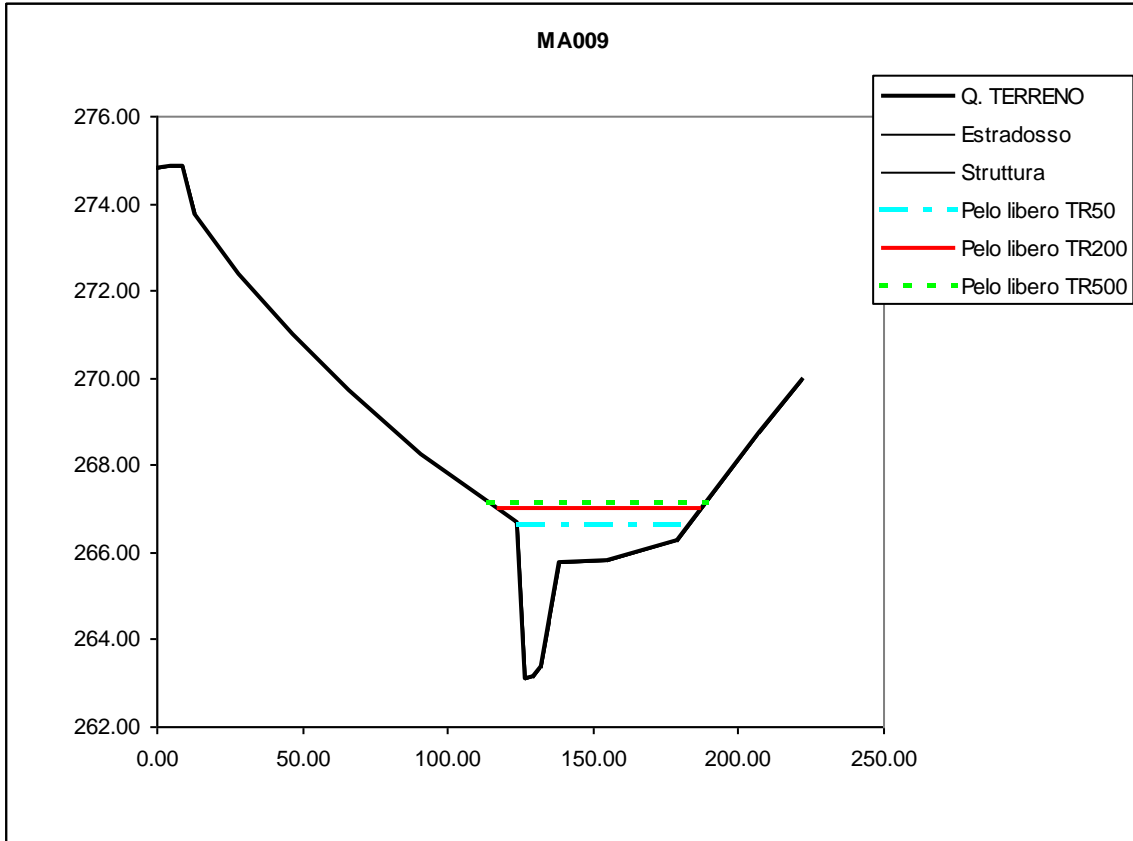


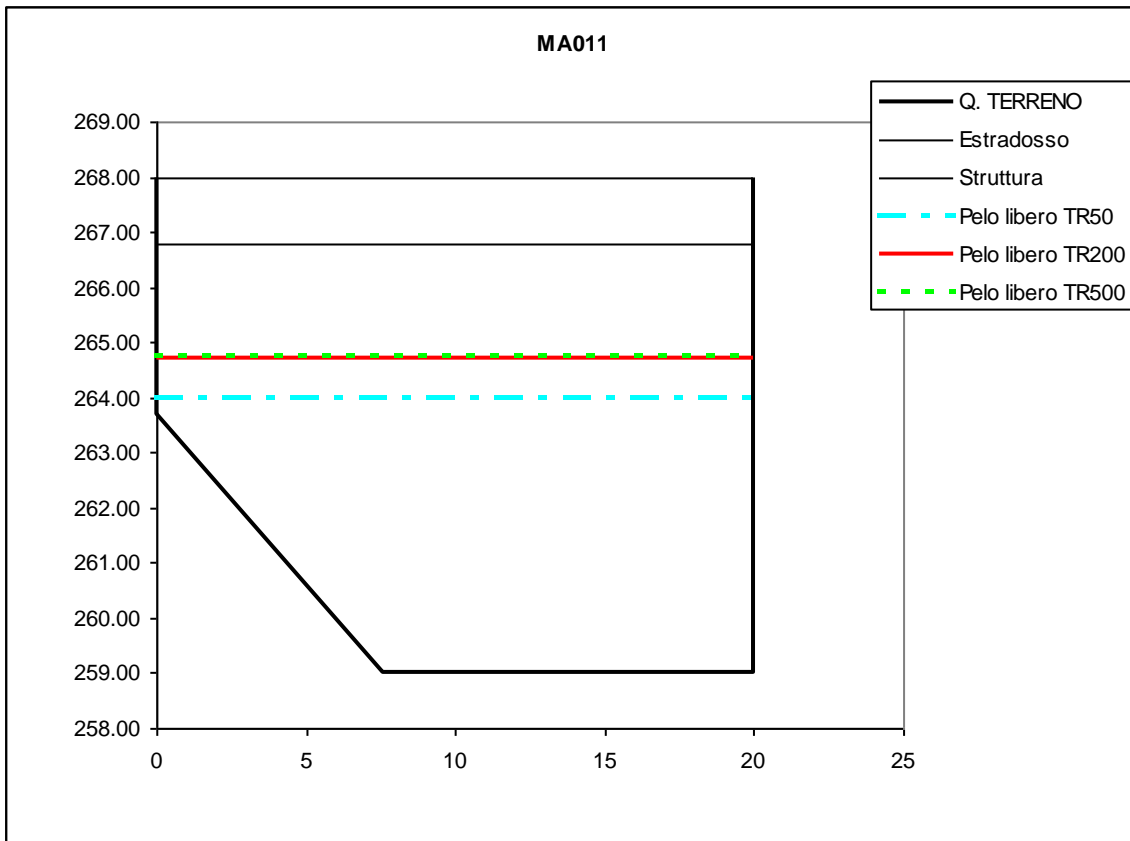
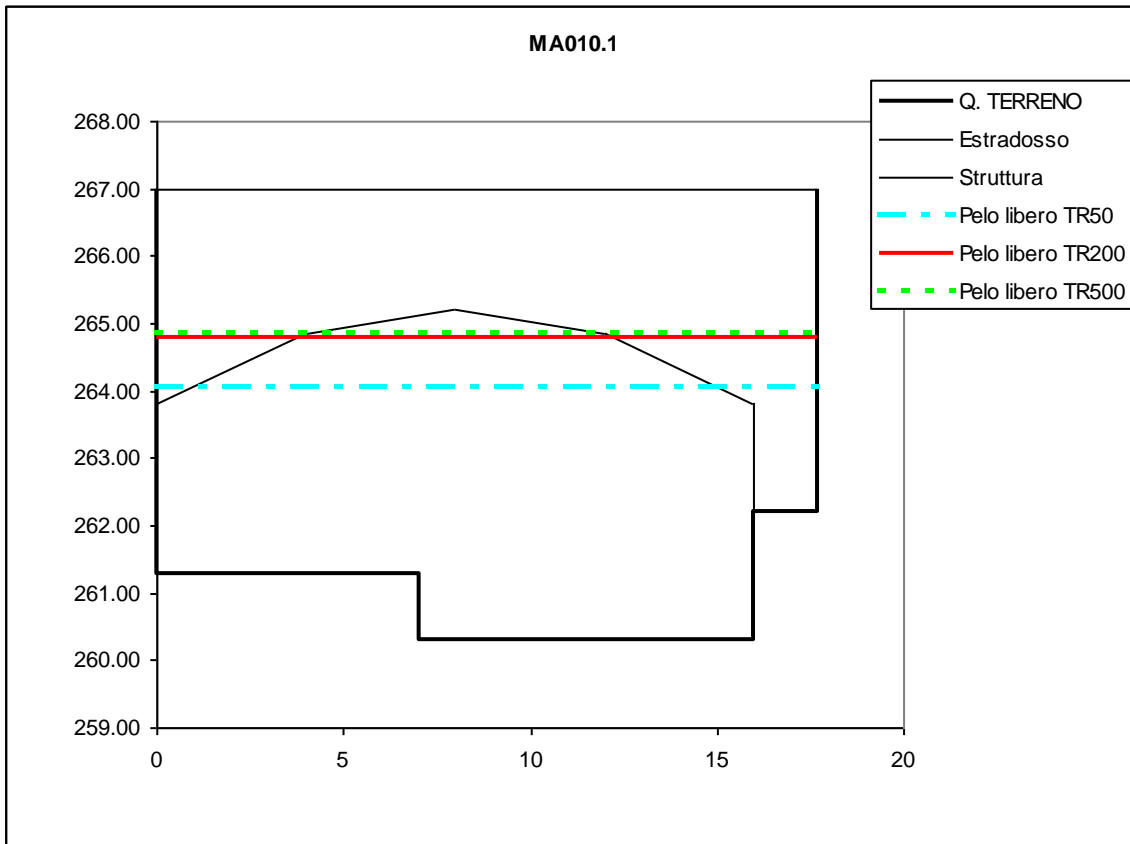




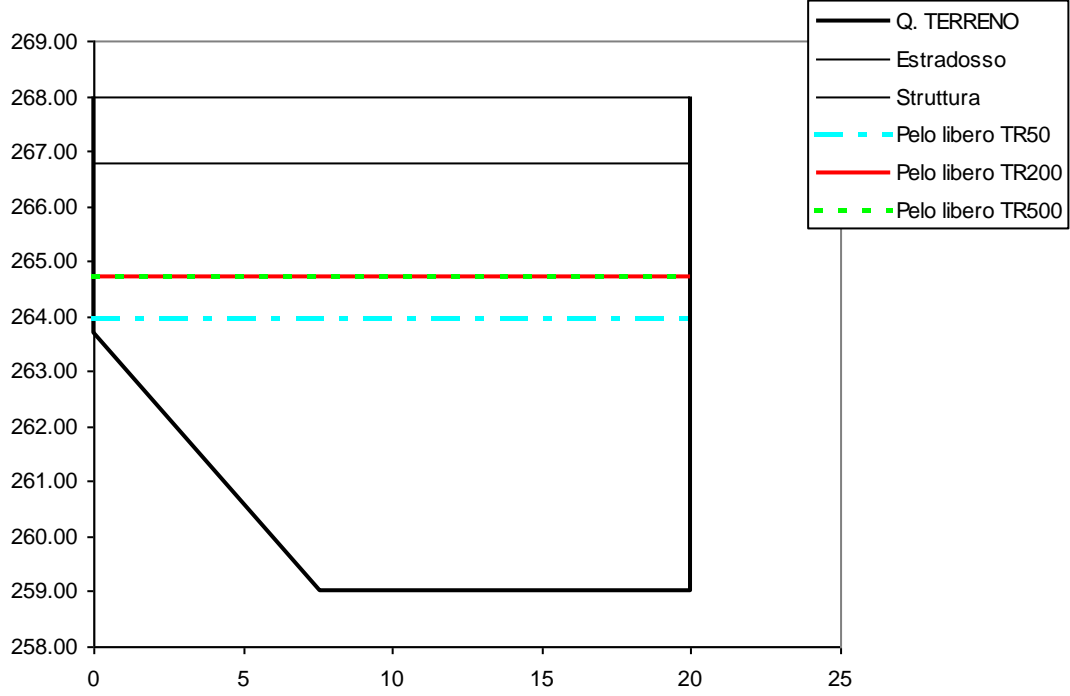




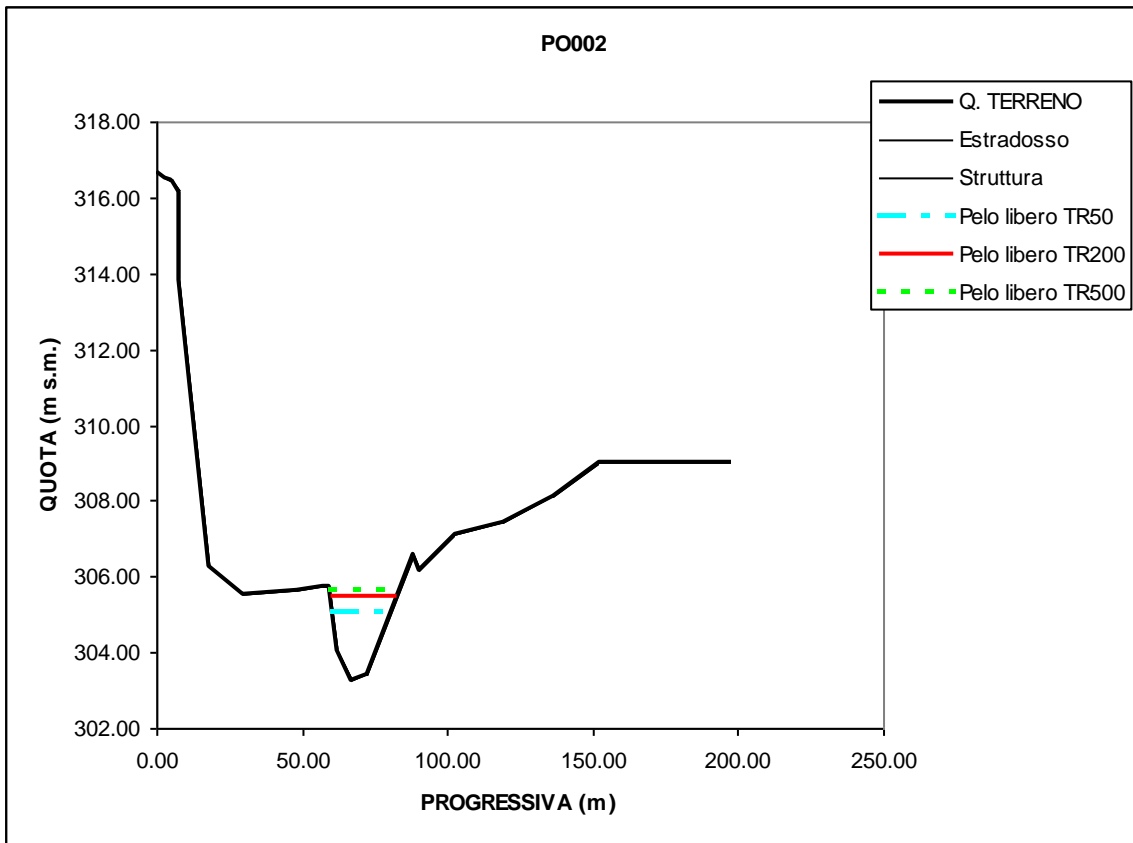
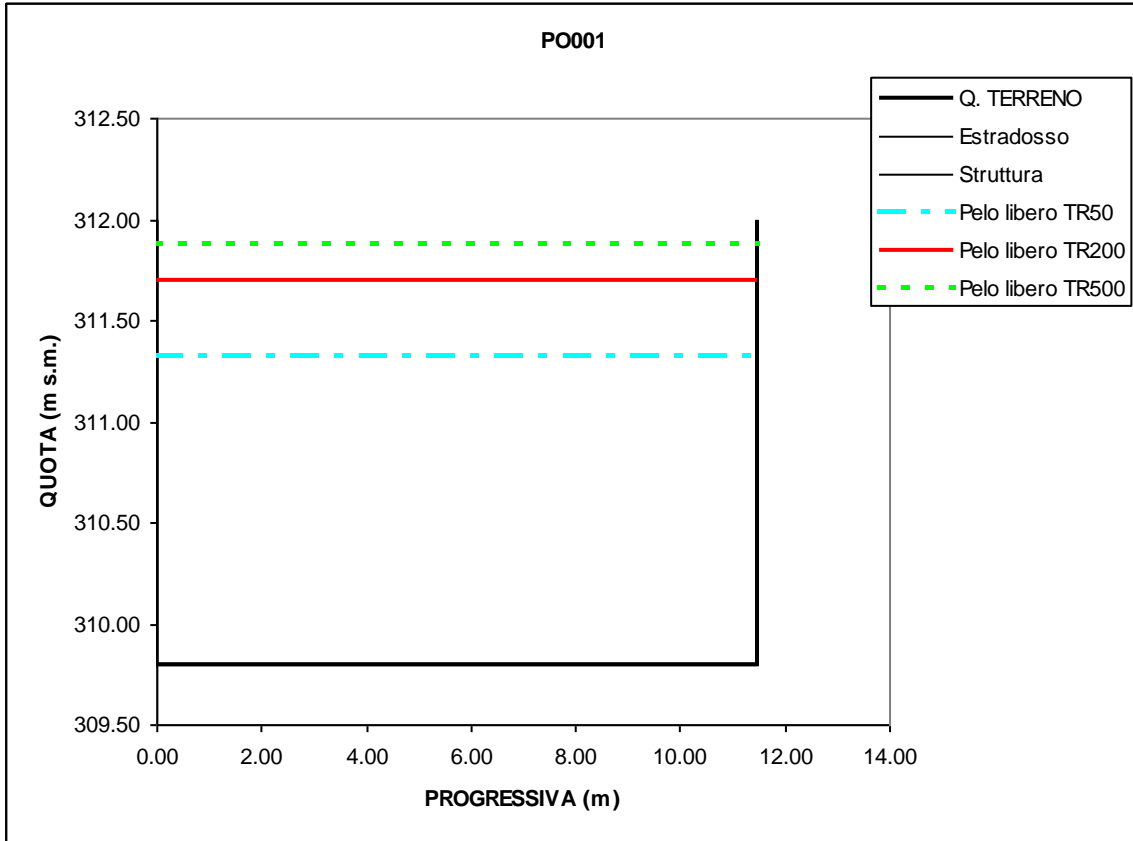


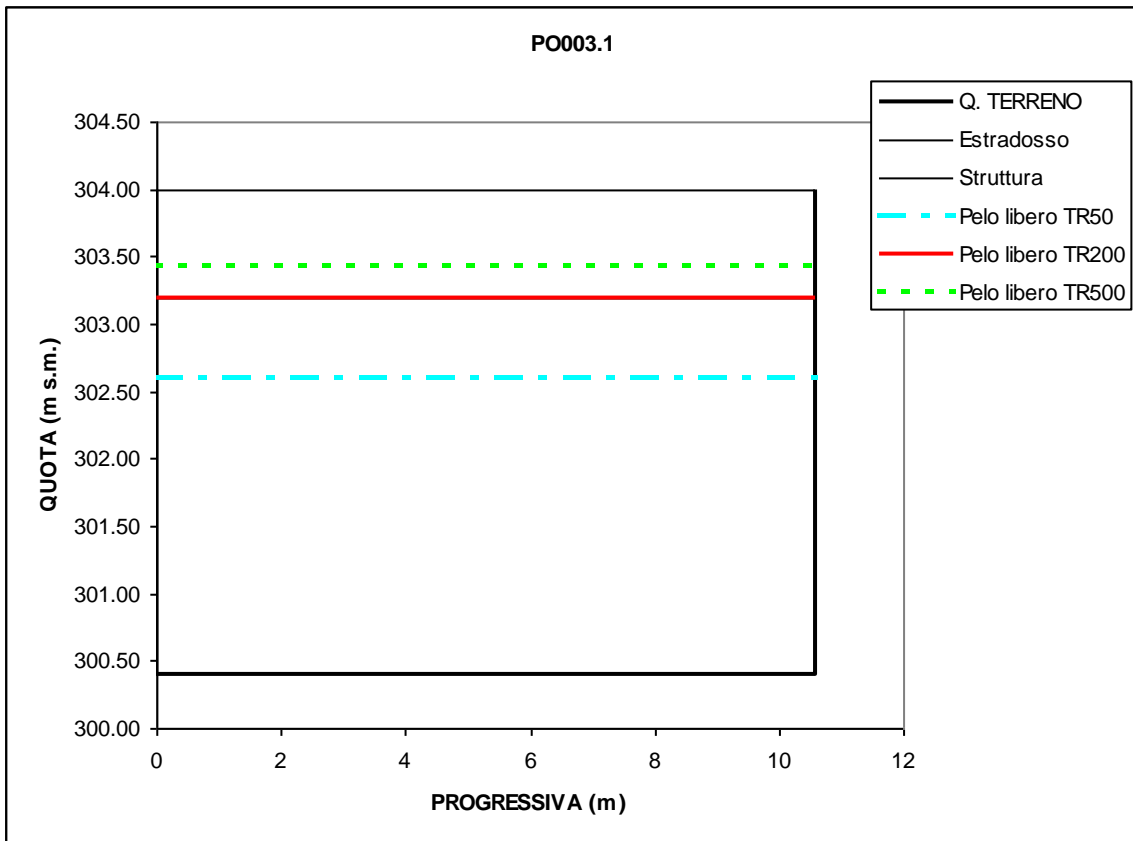
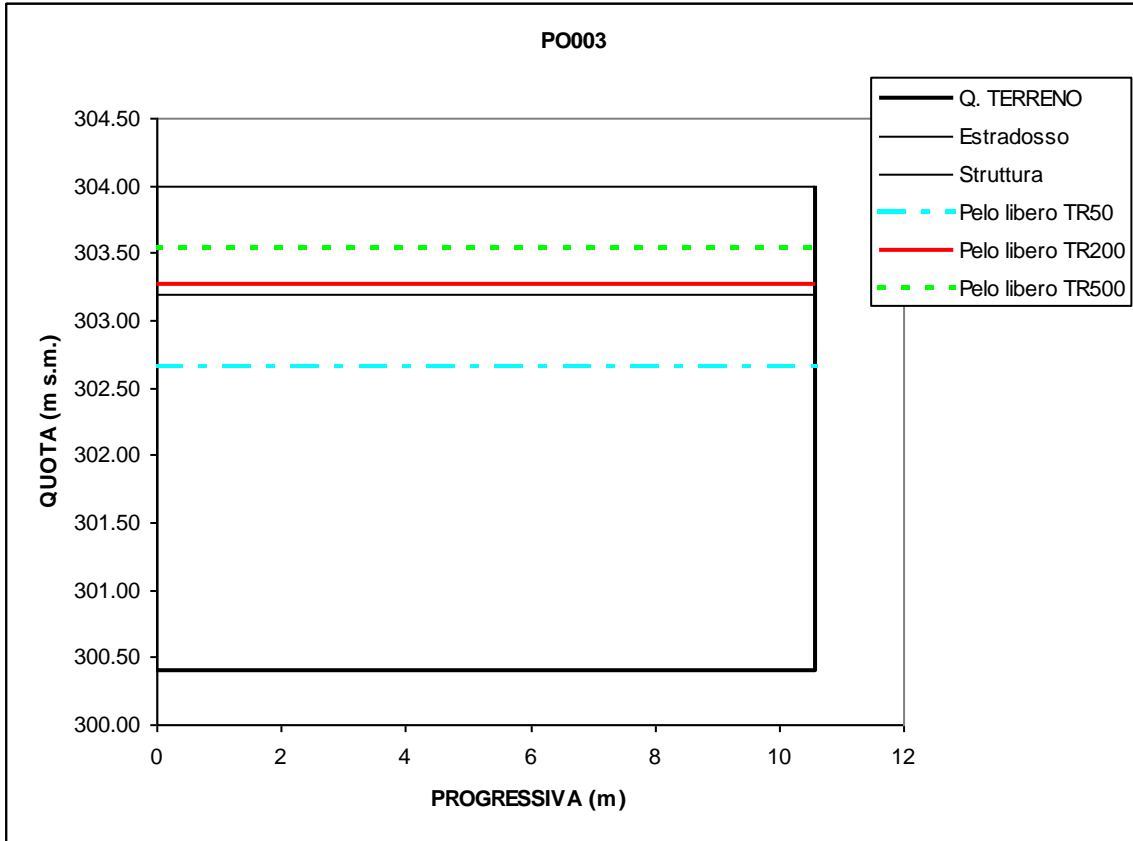


MA011.1

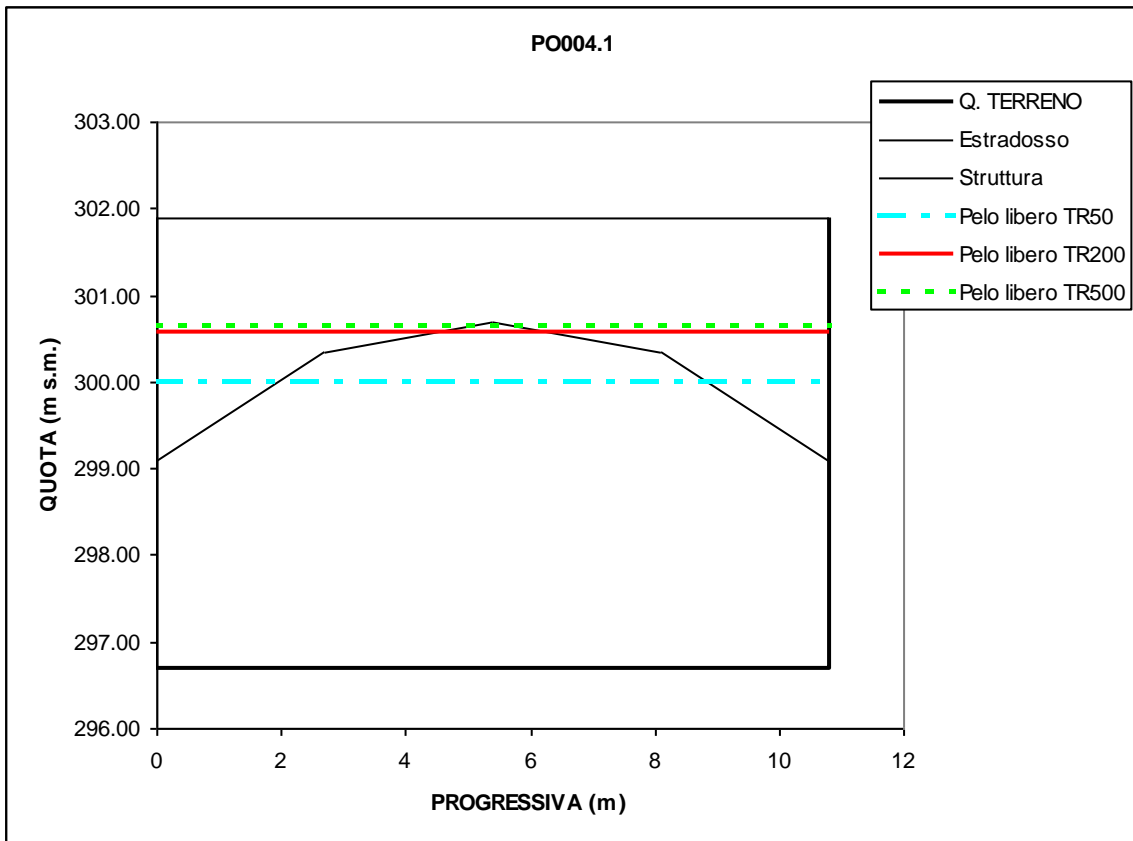
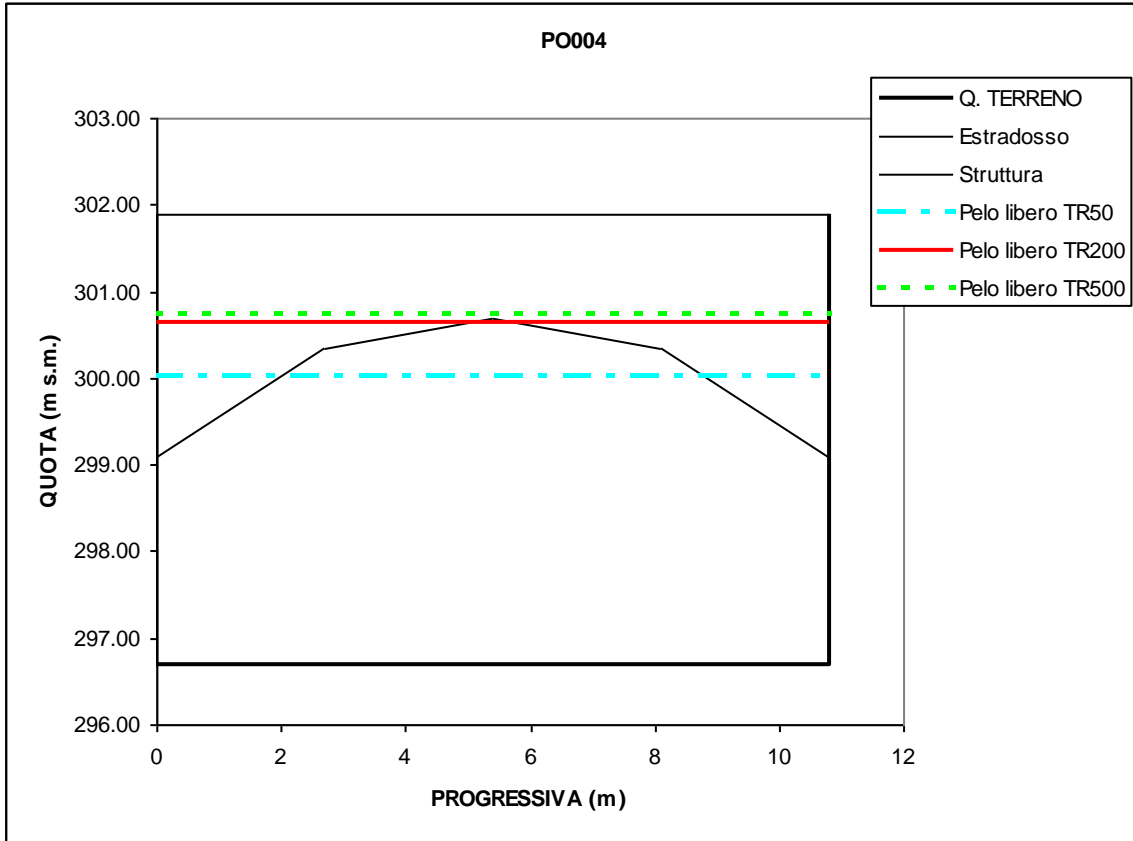


# RIO POLLOVERO

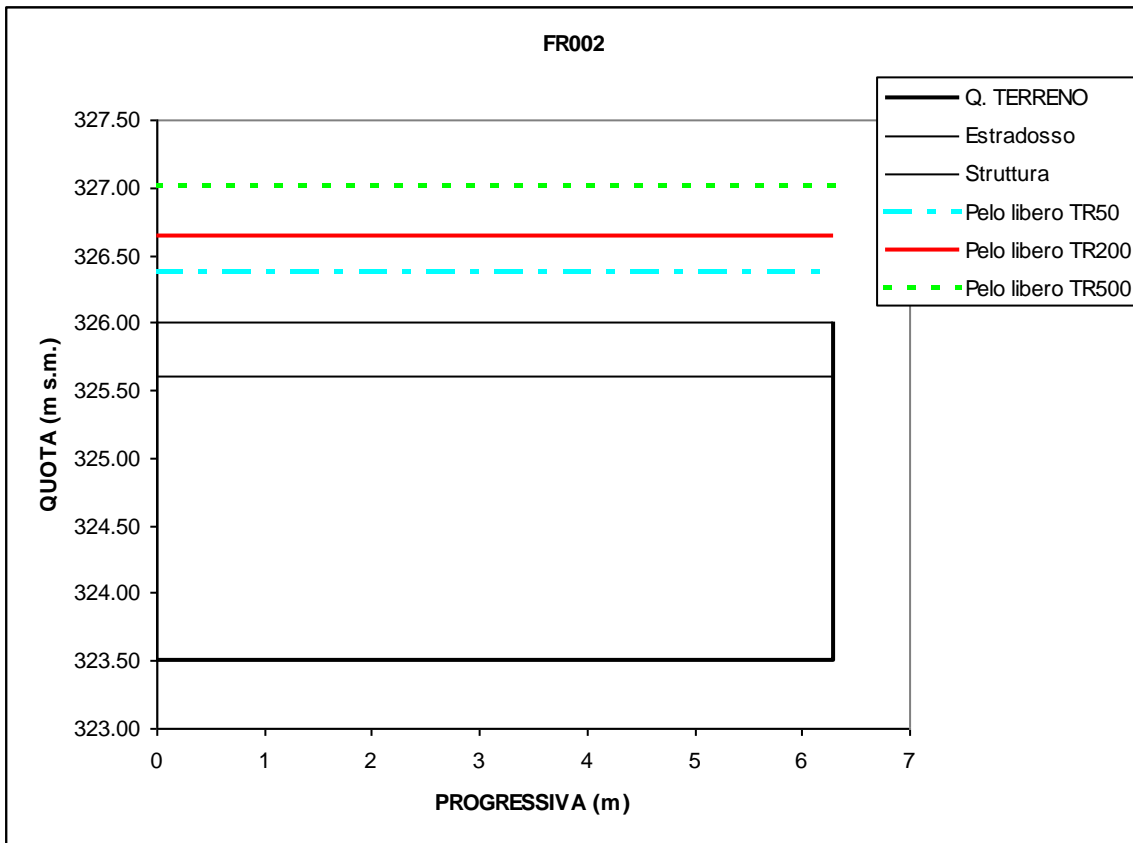
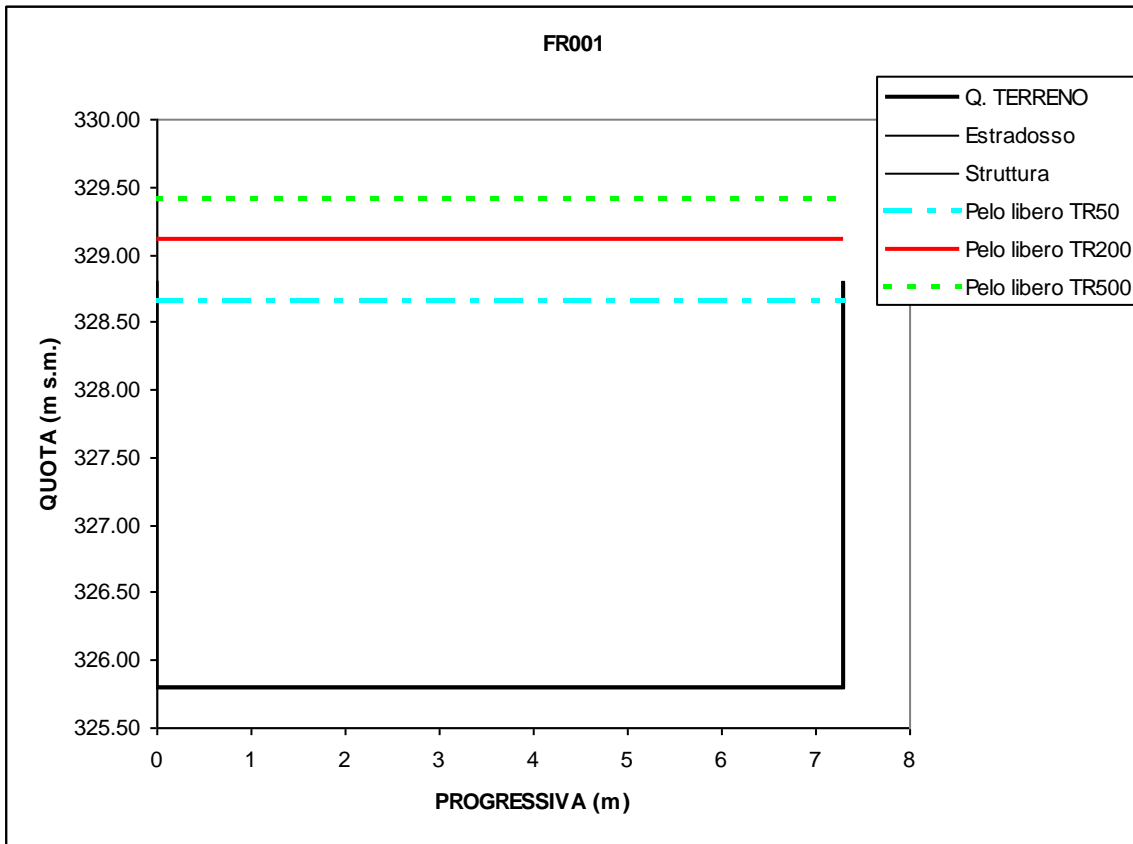


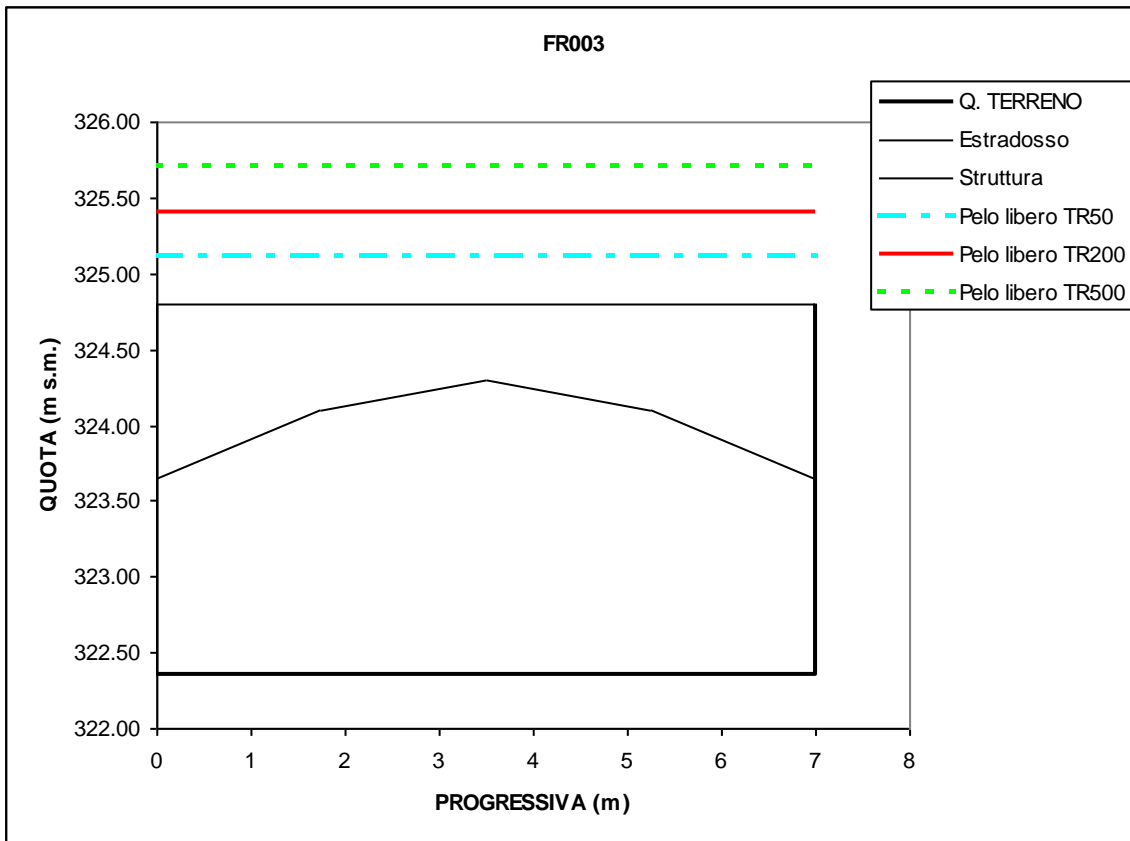
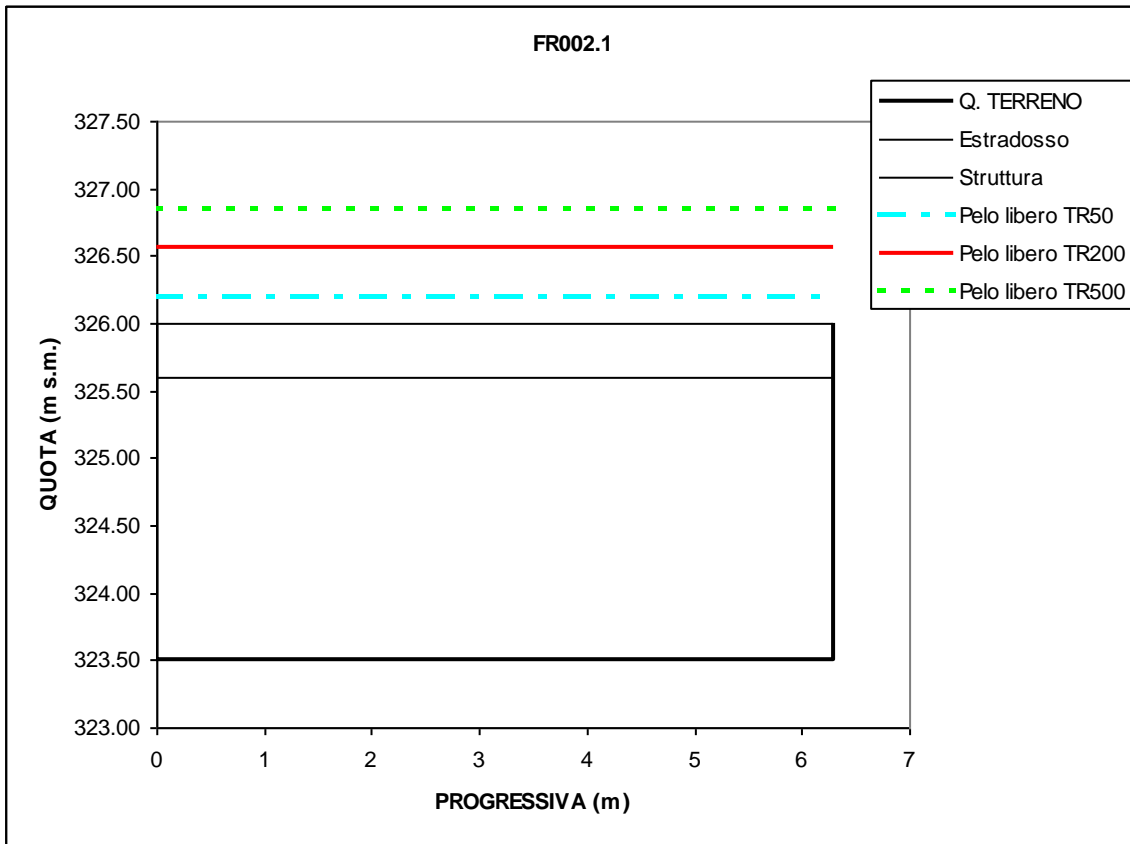


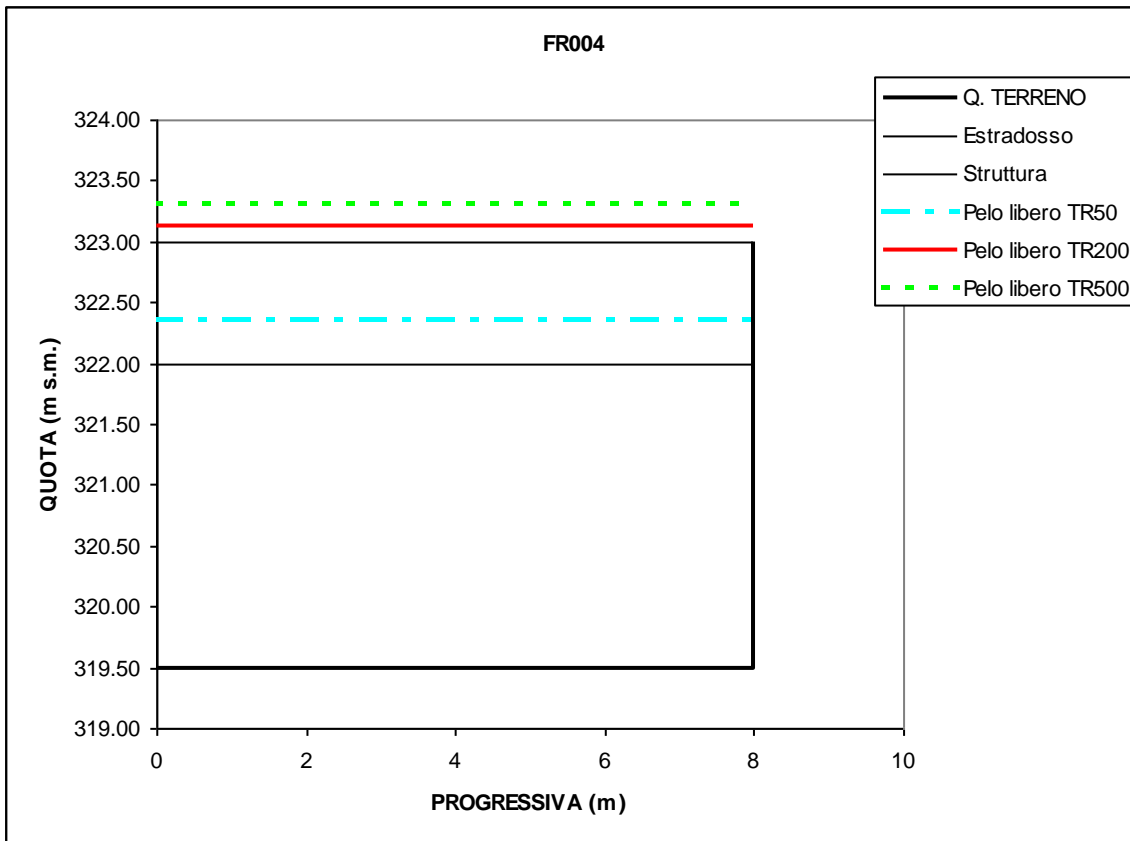
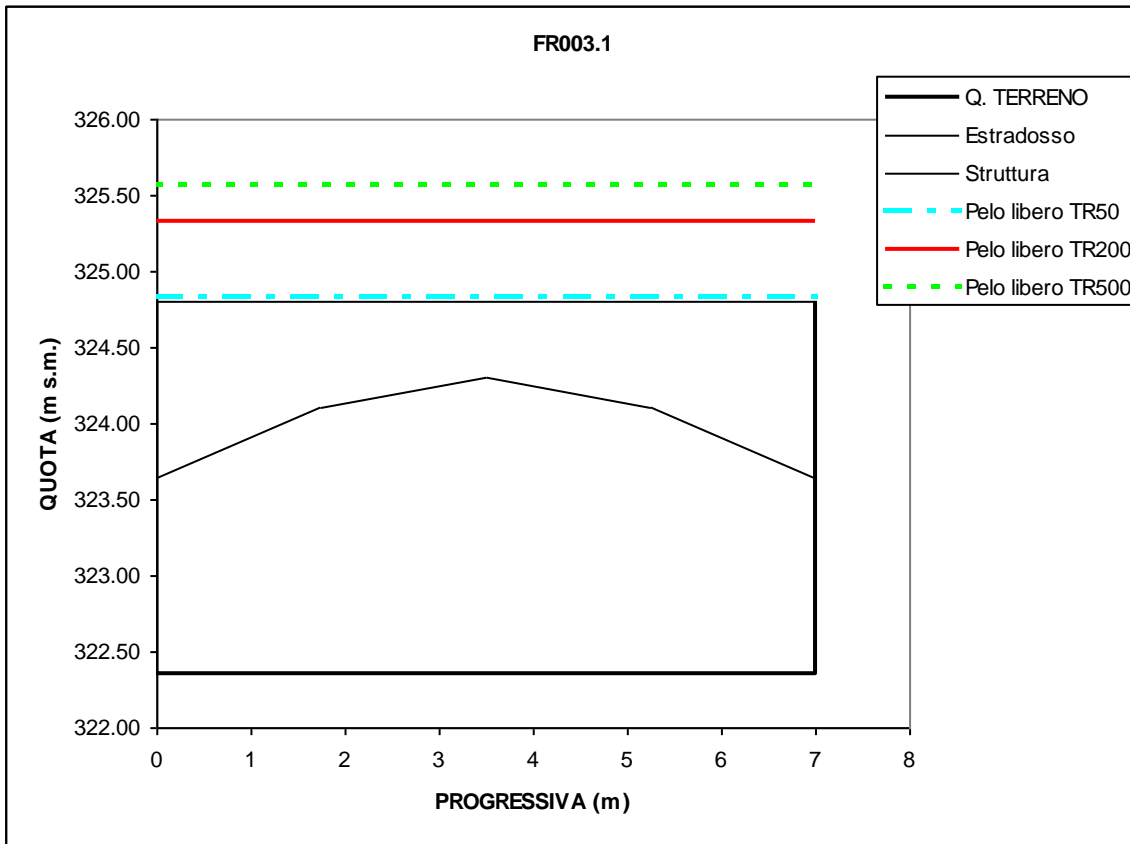


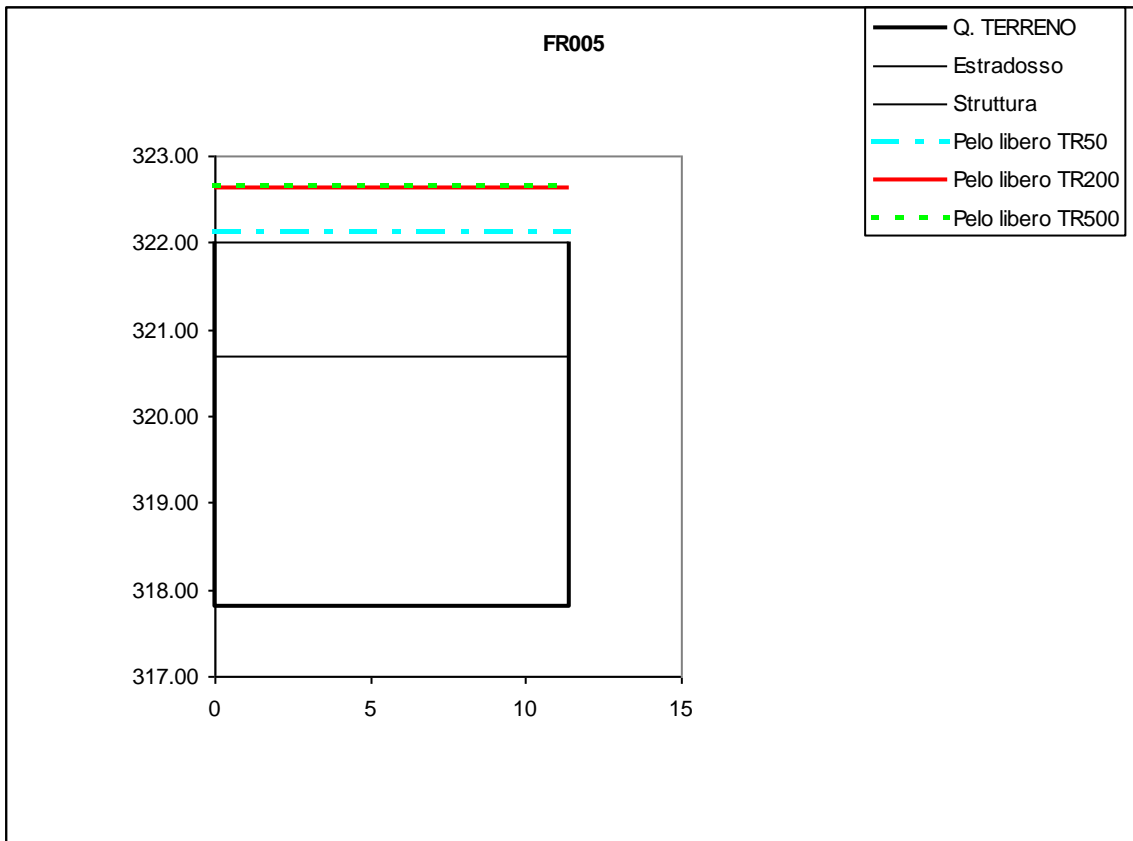
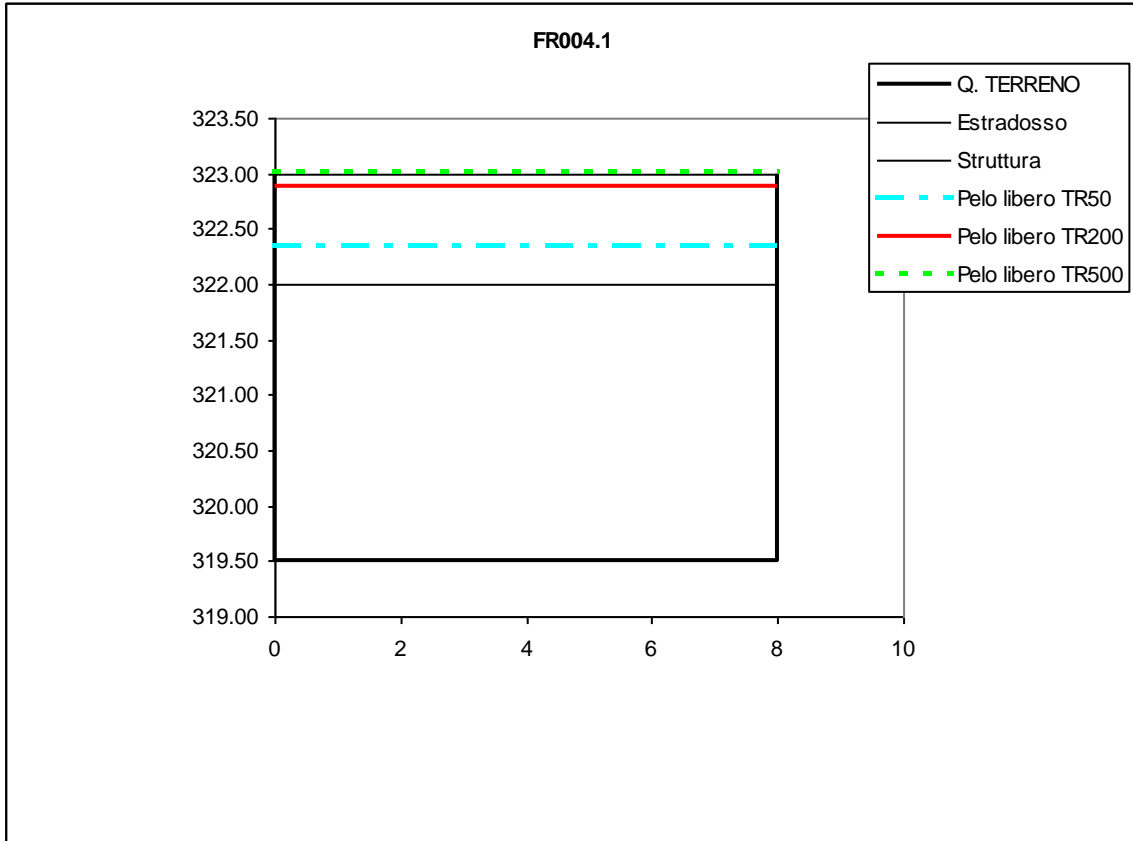


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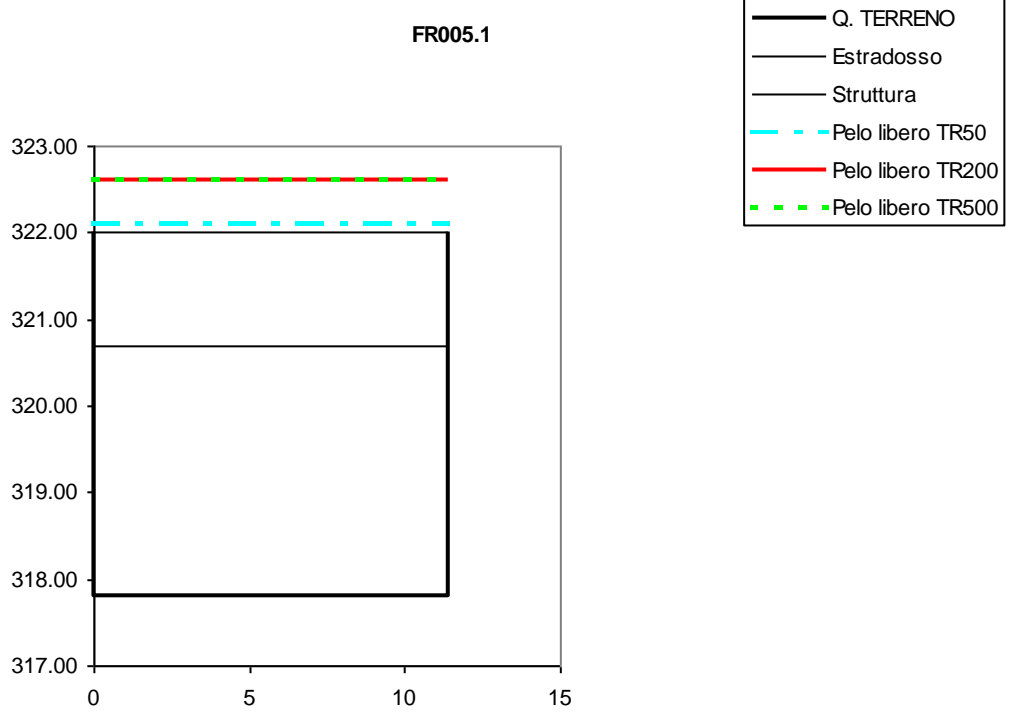






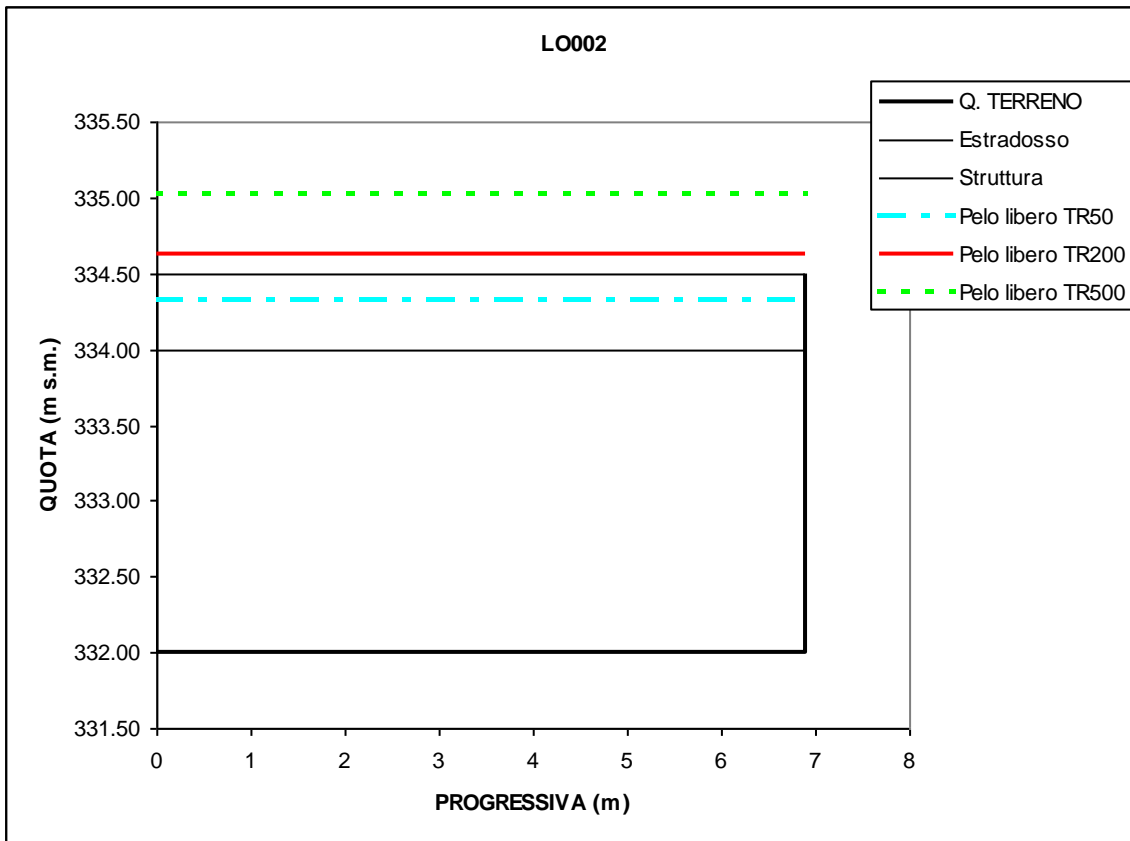
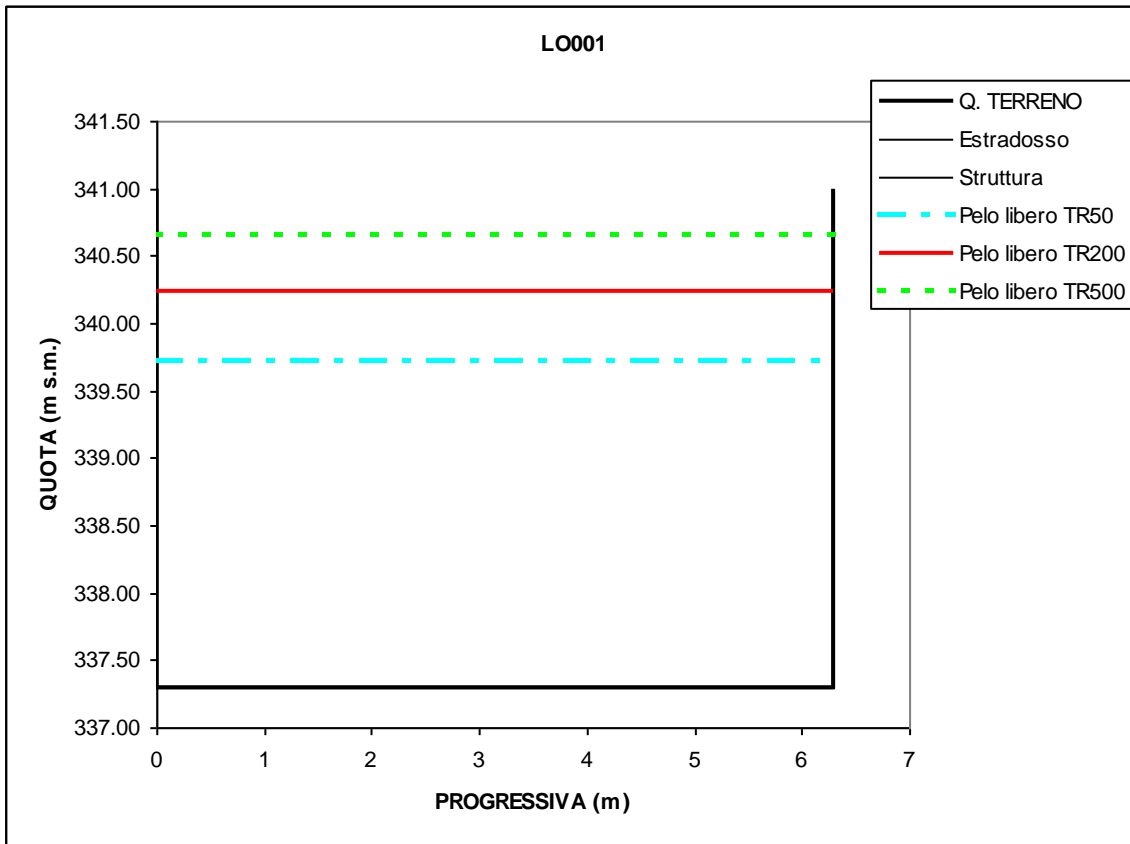


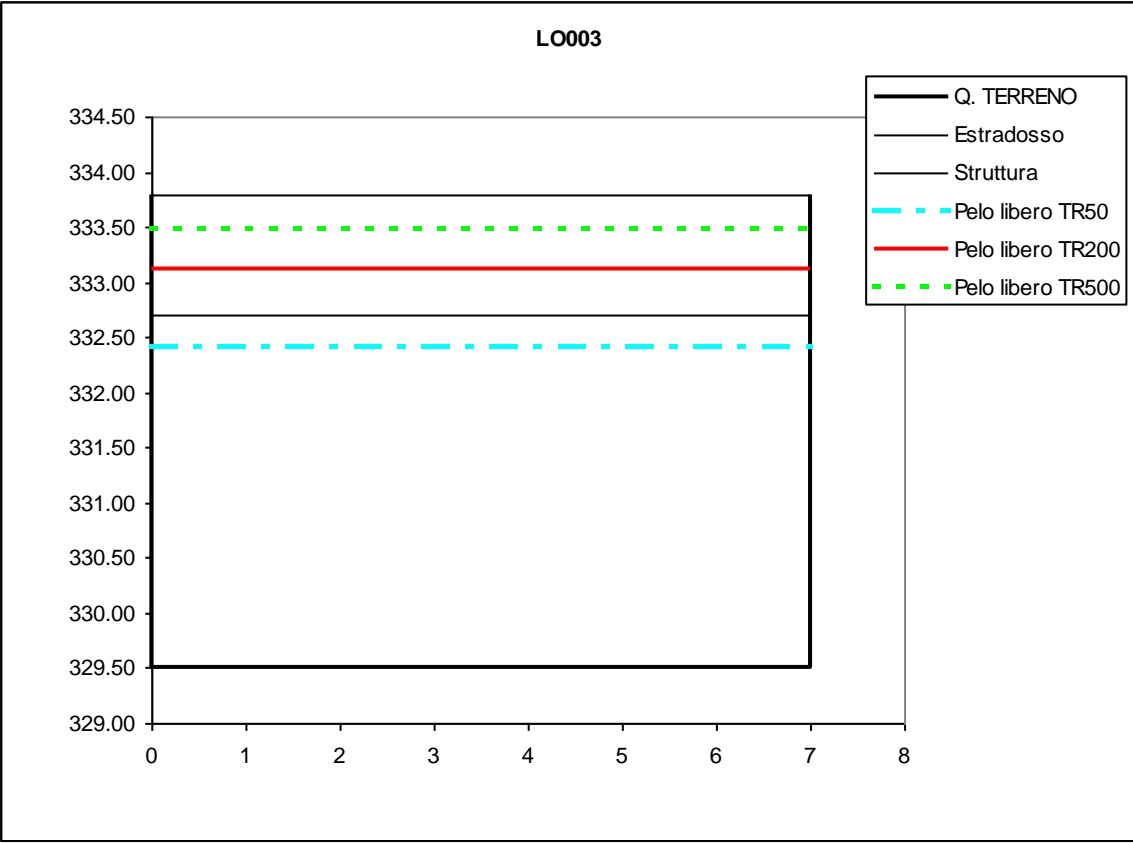
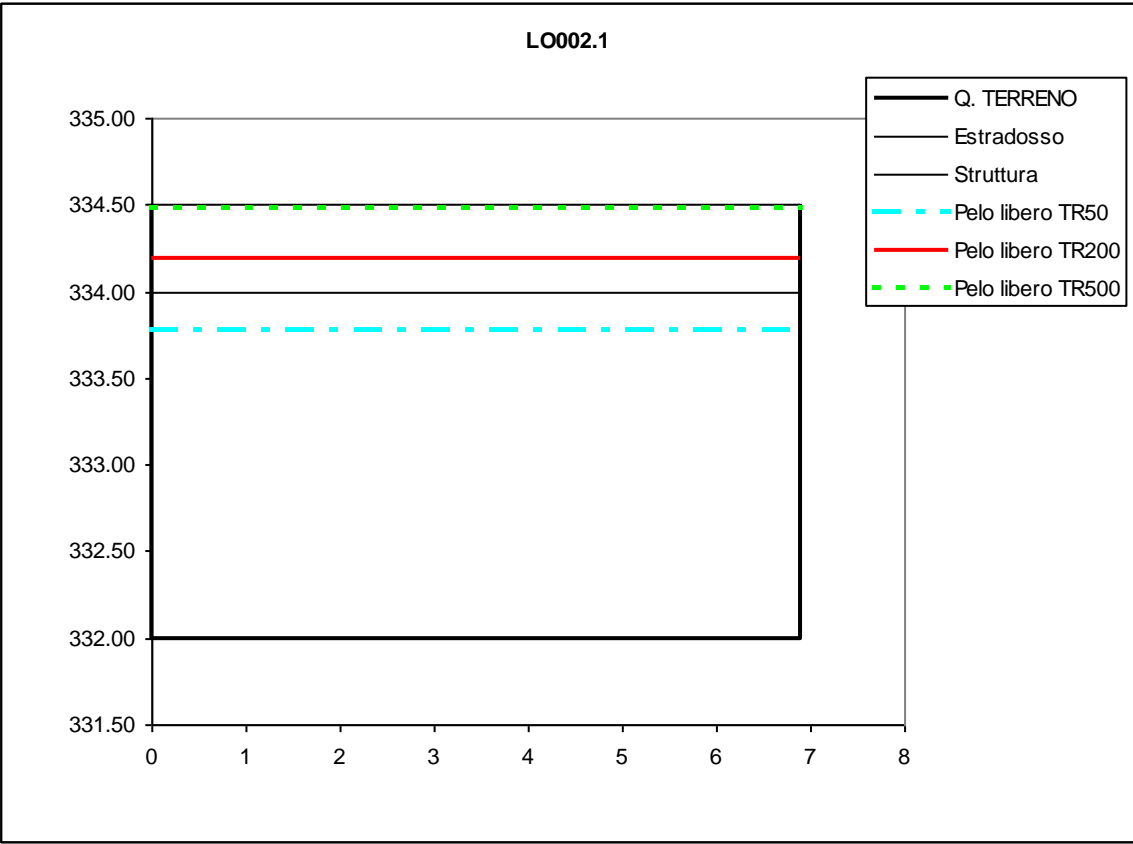
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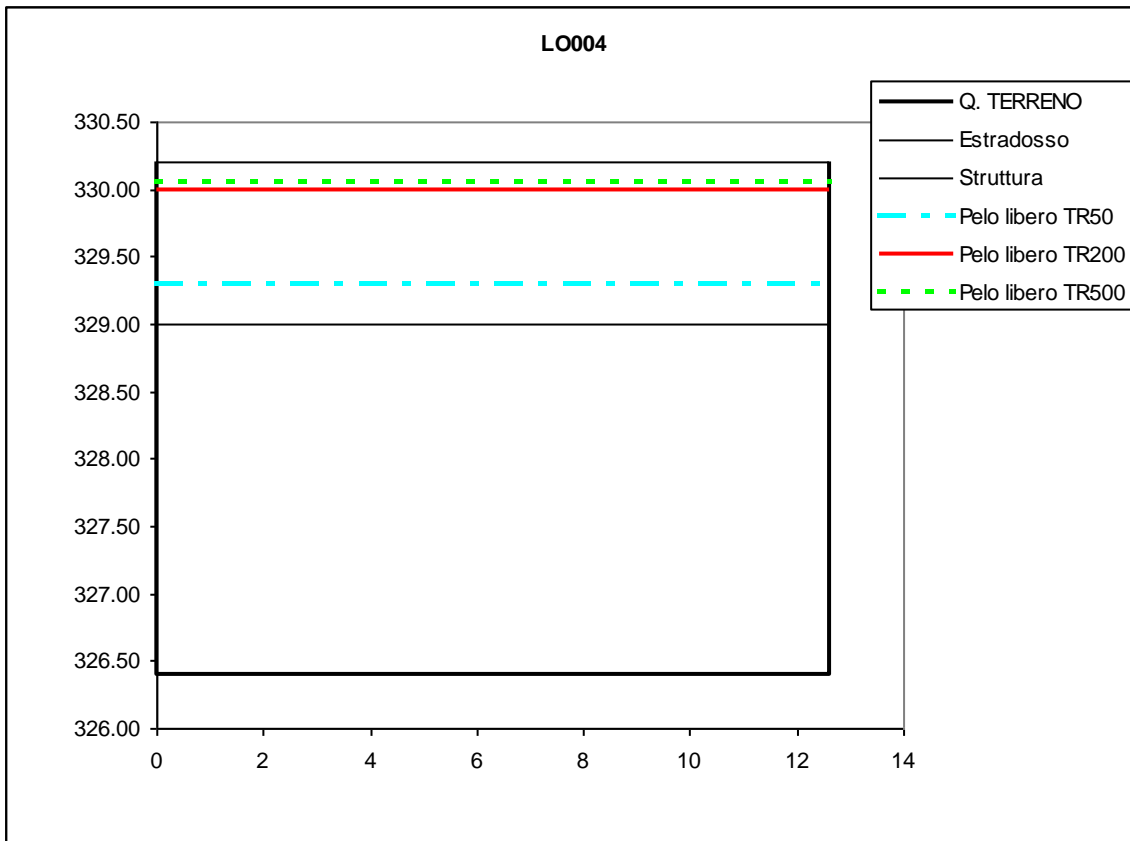
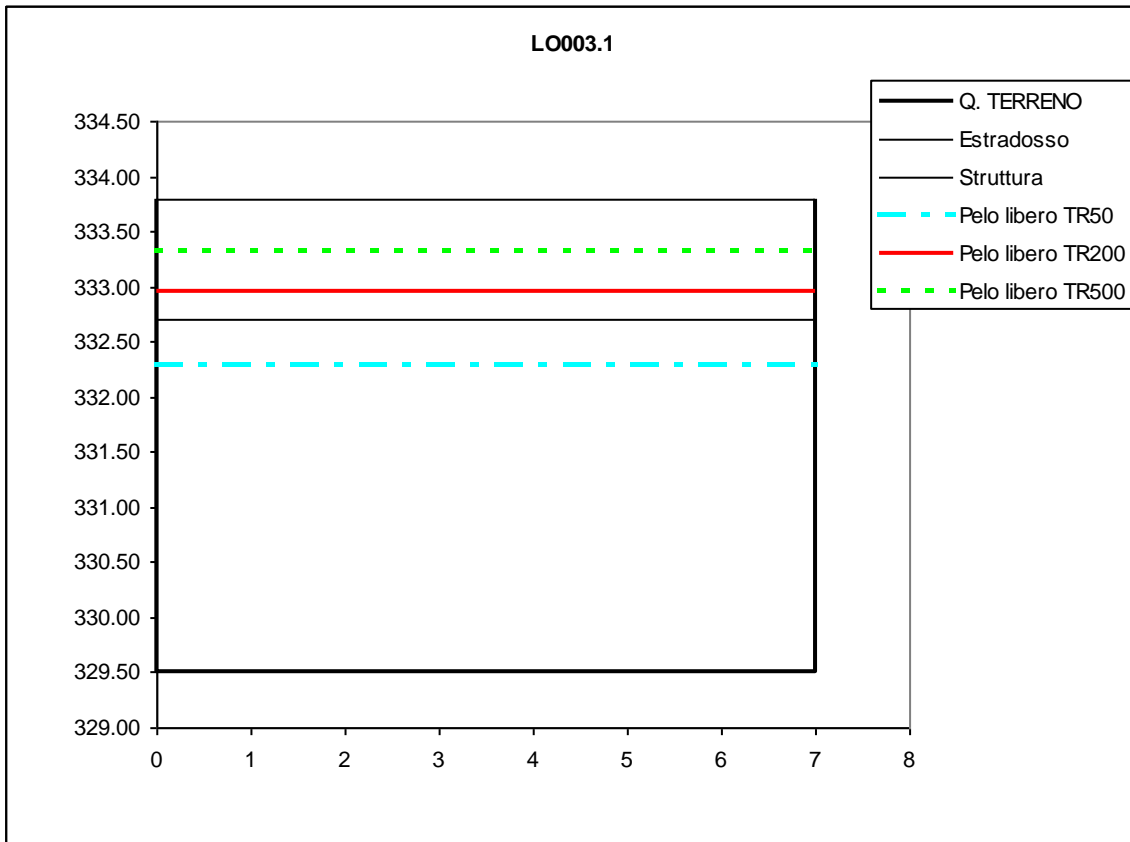


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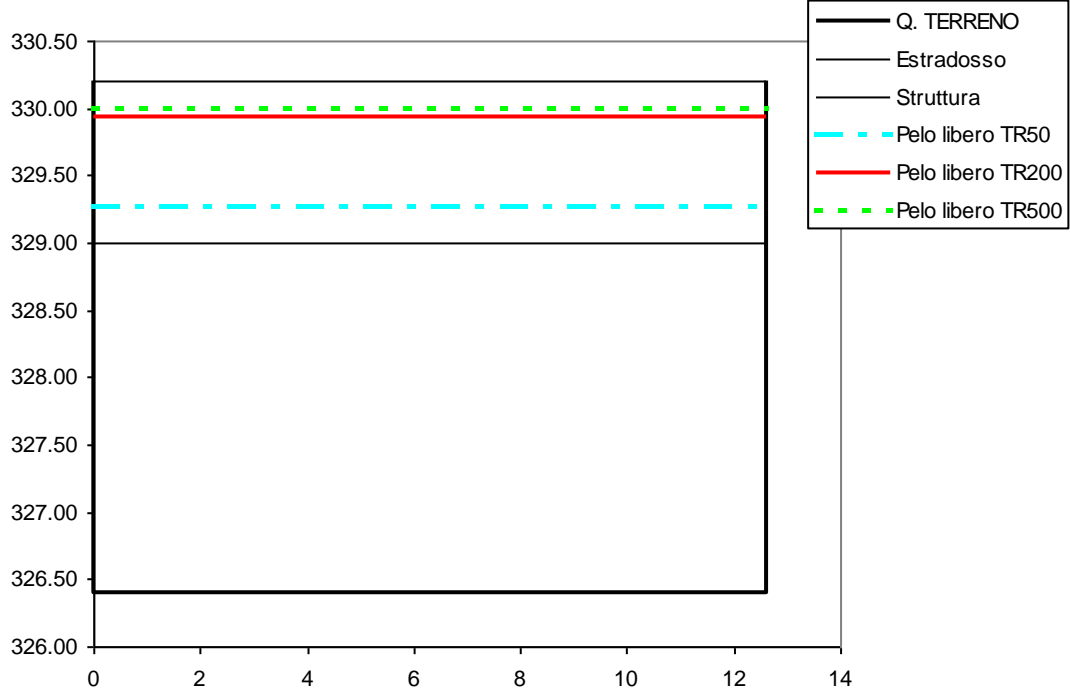




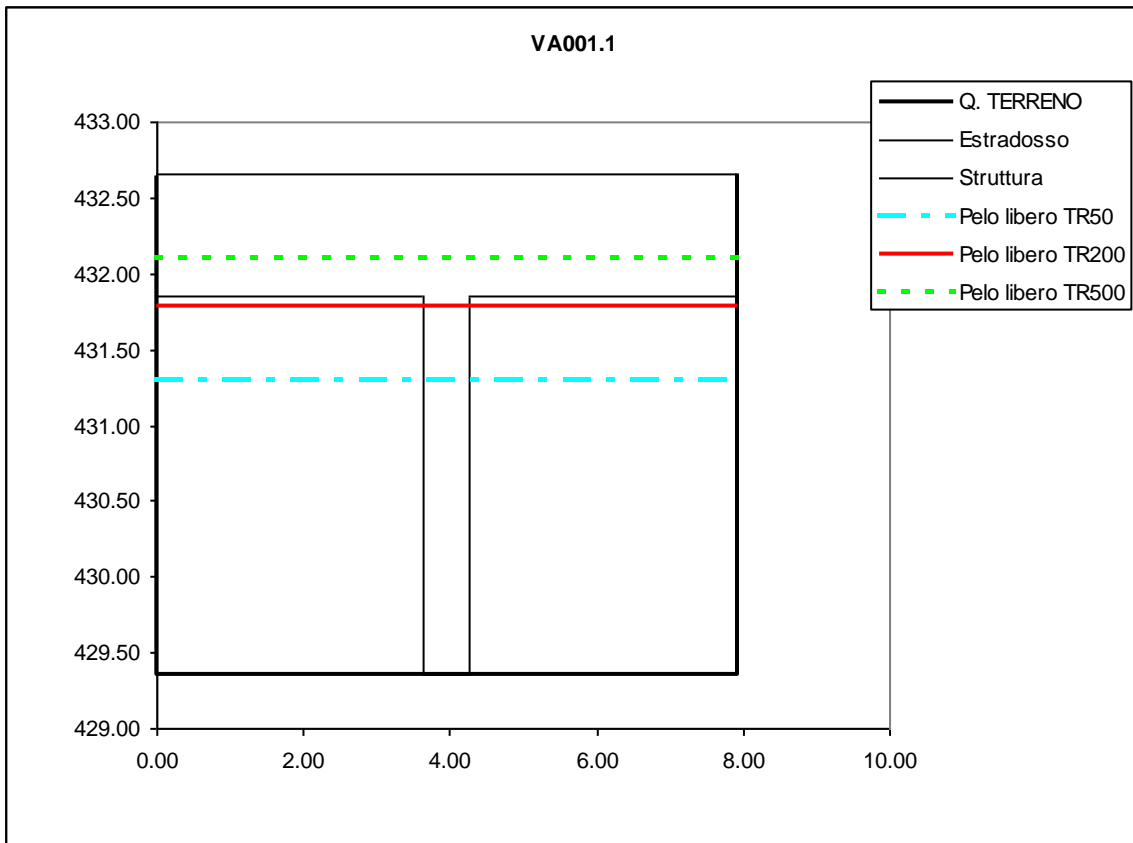
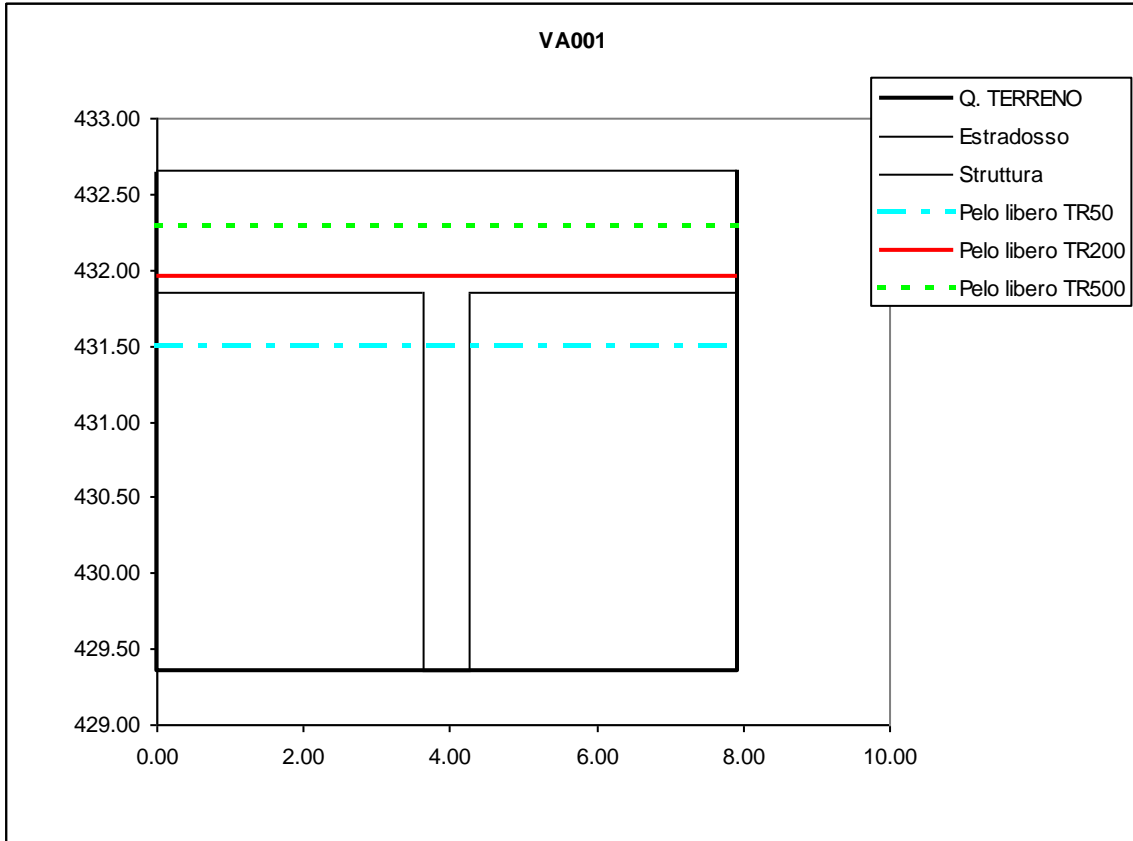


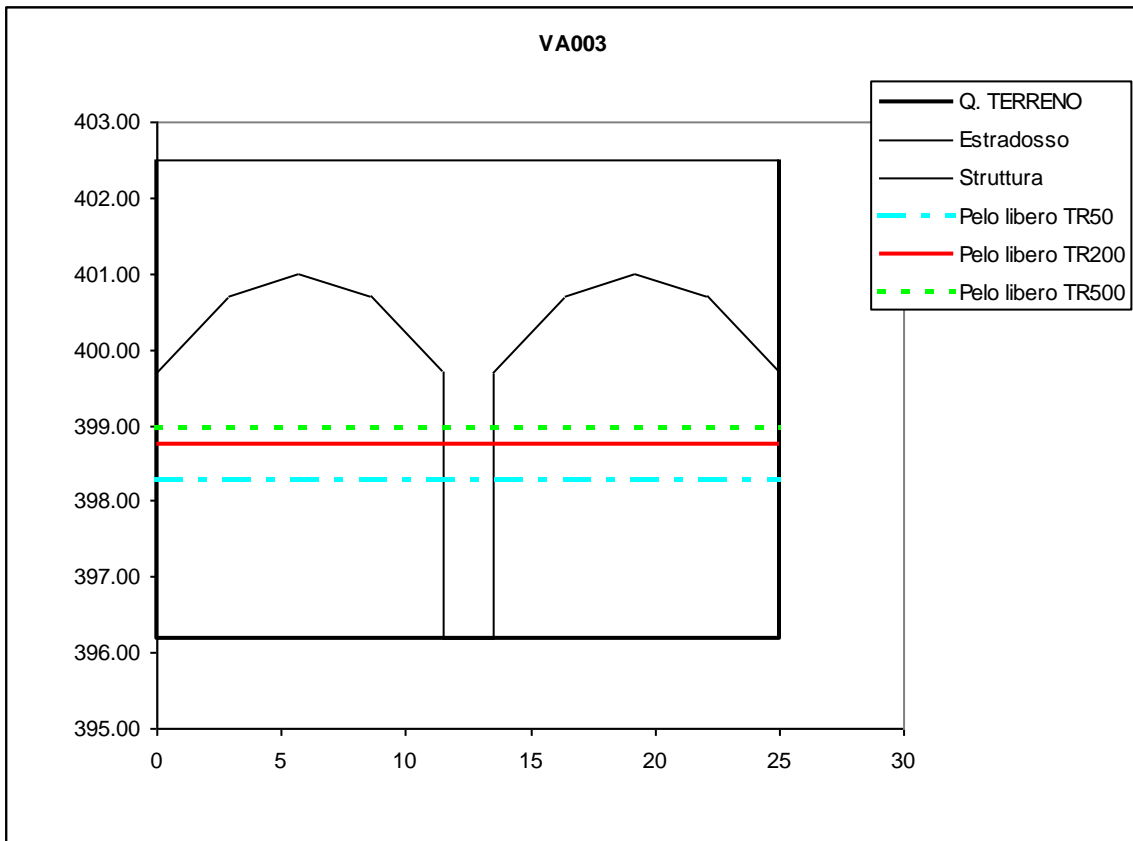
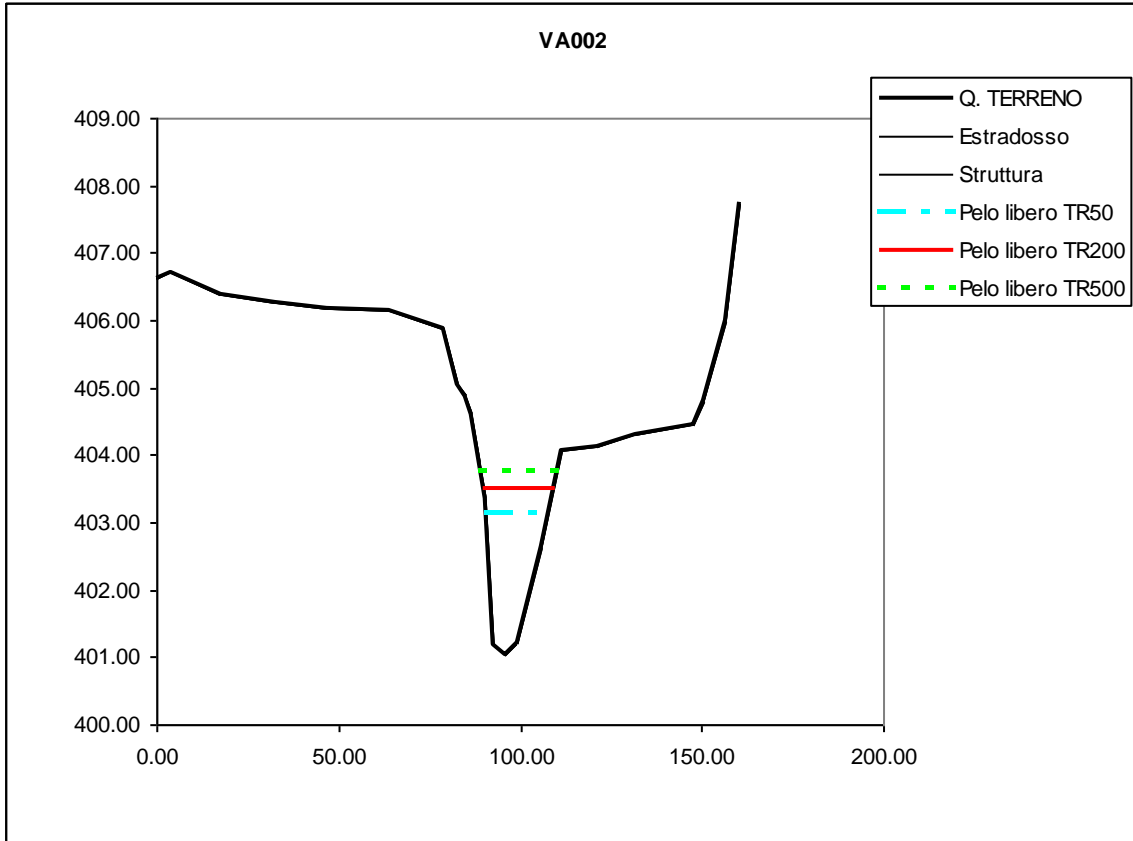


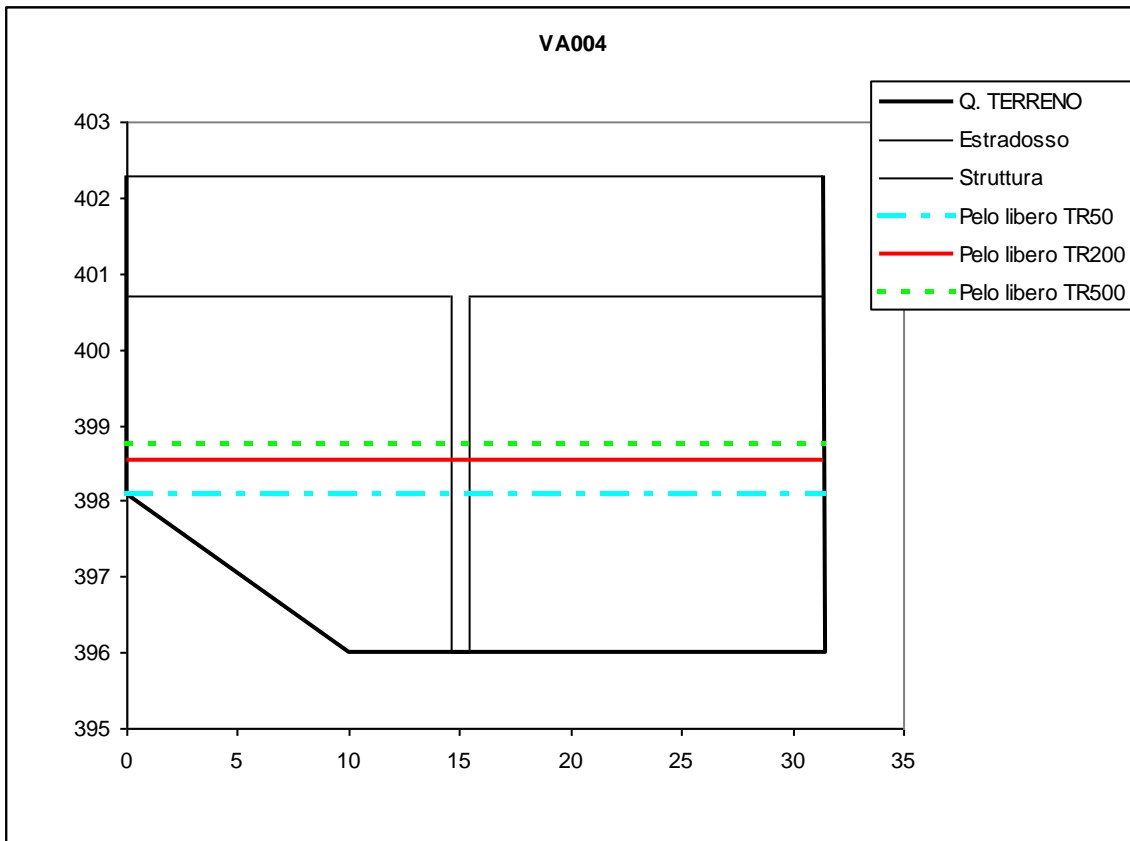
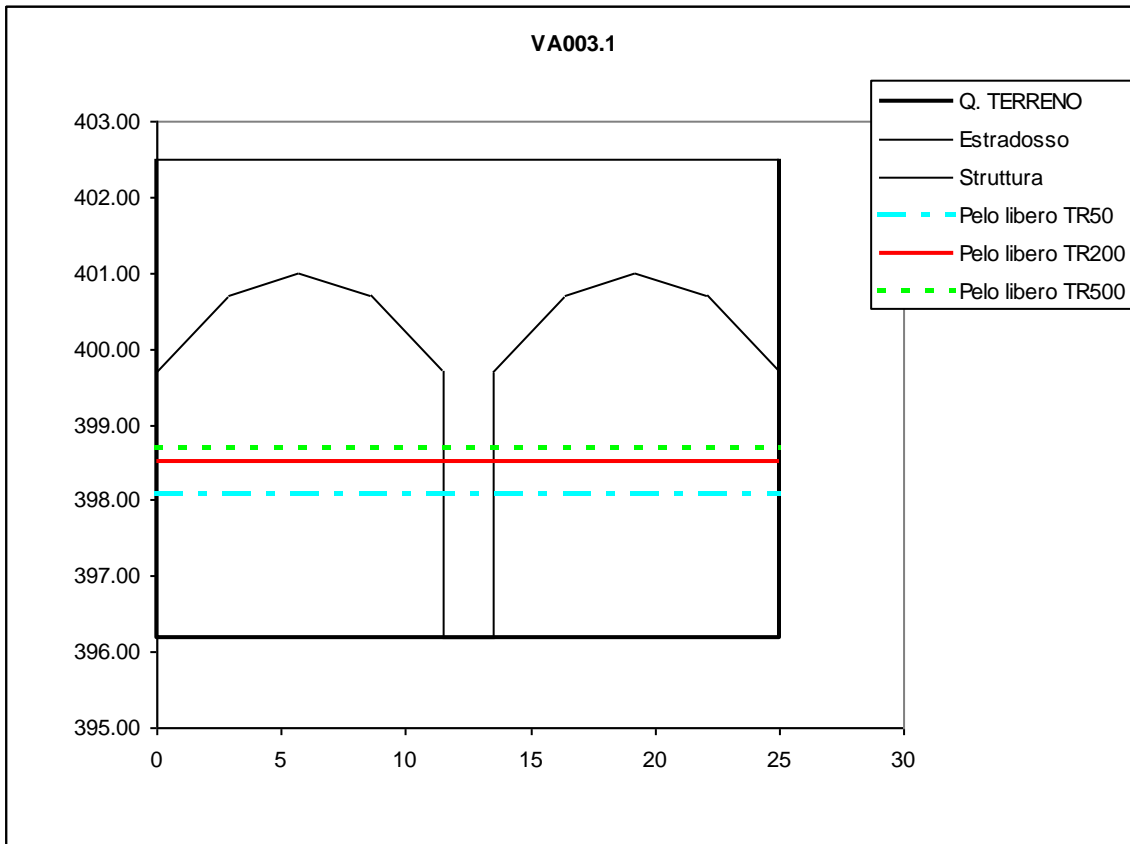
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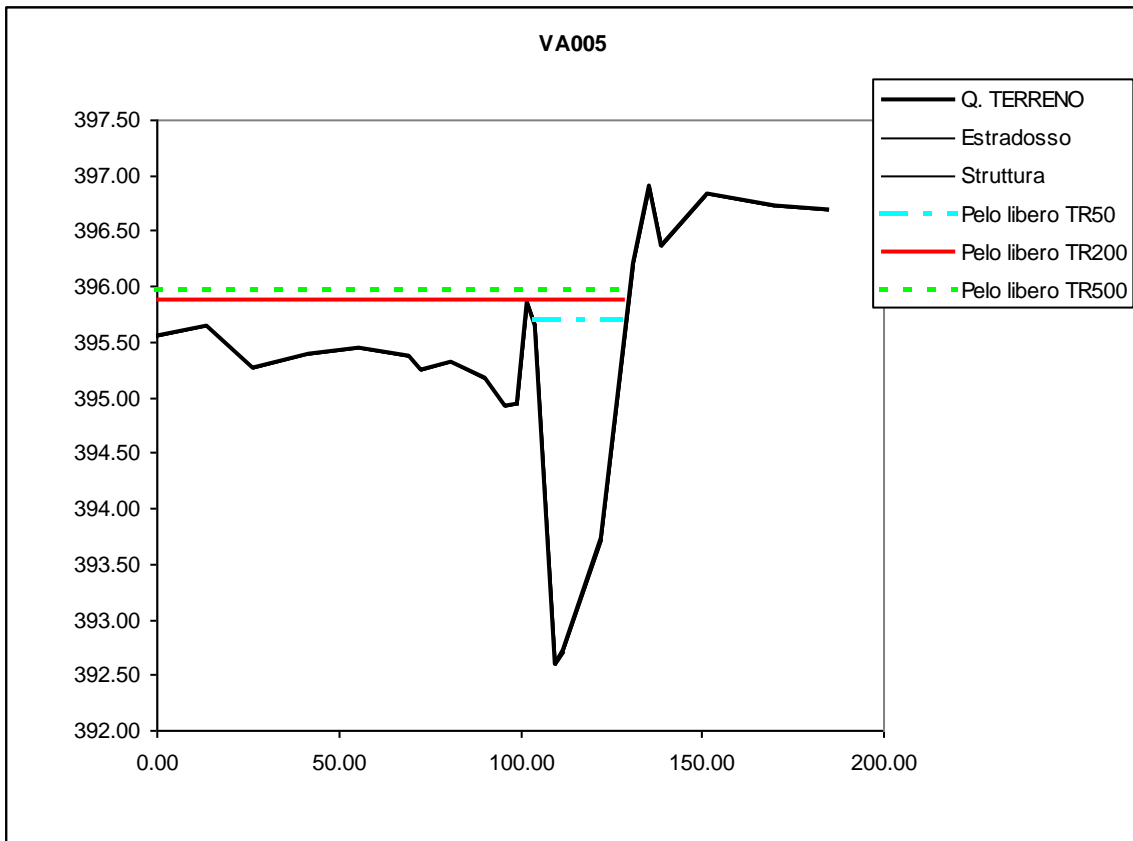
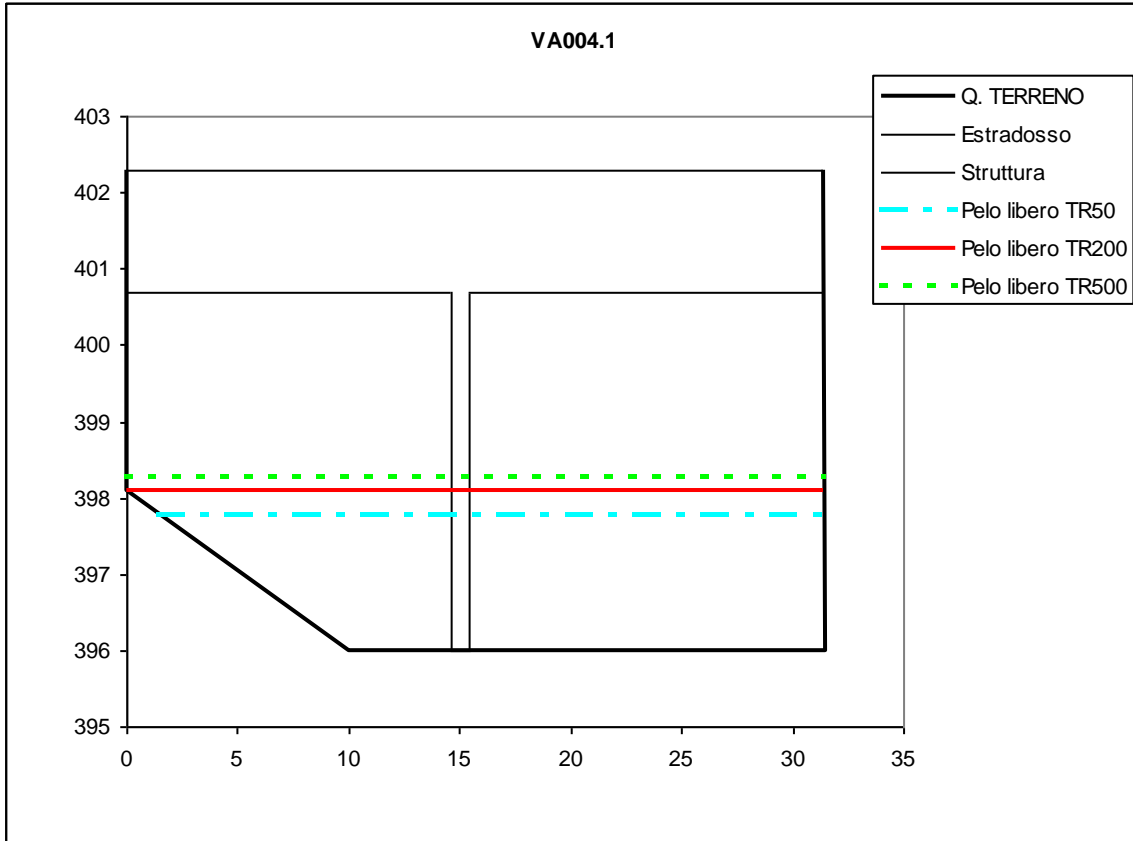
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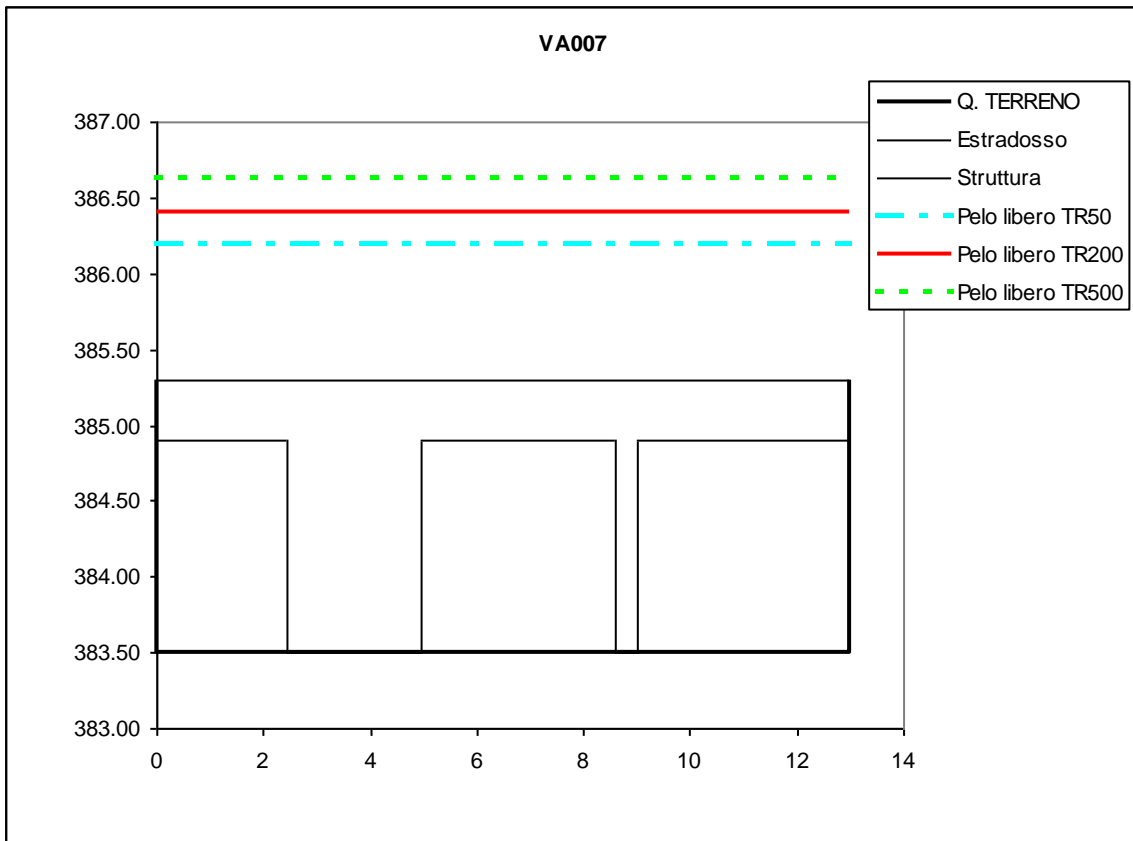
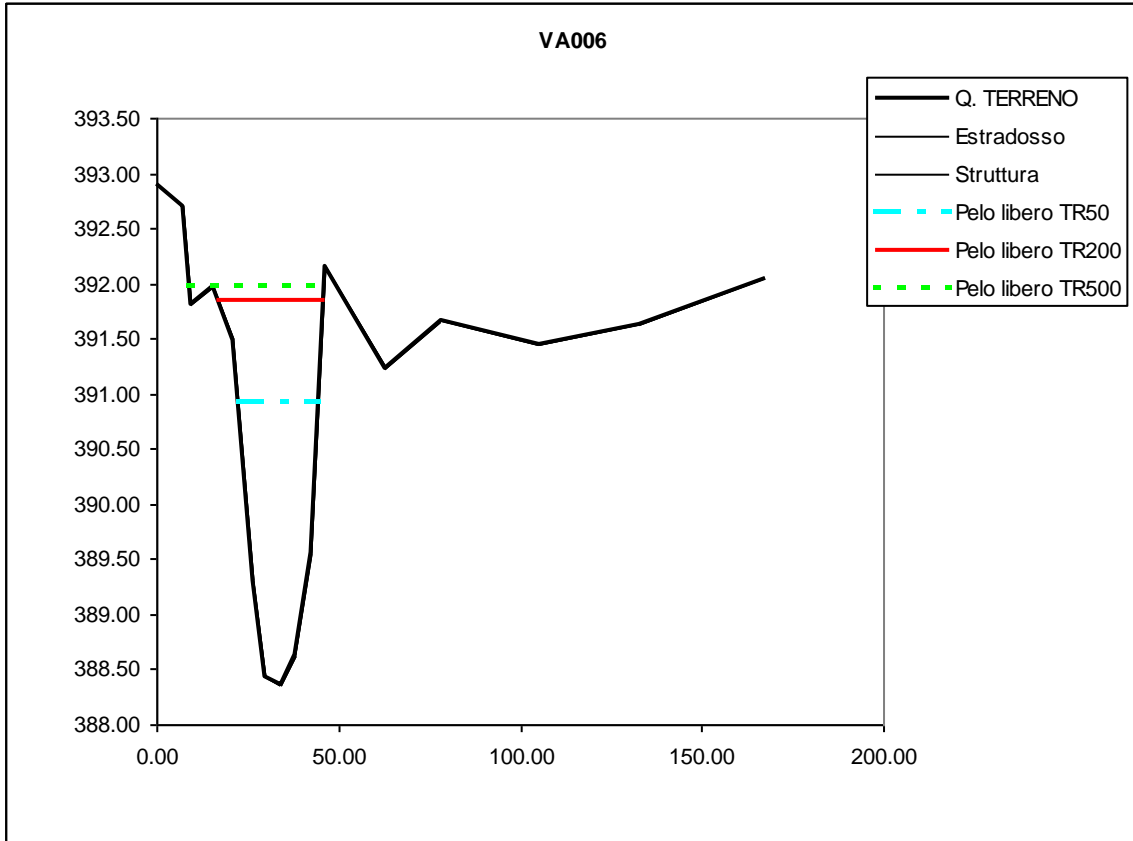


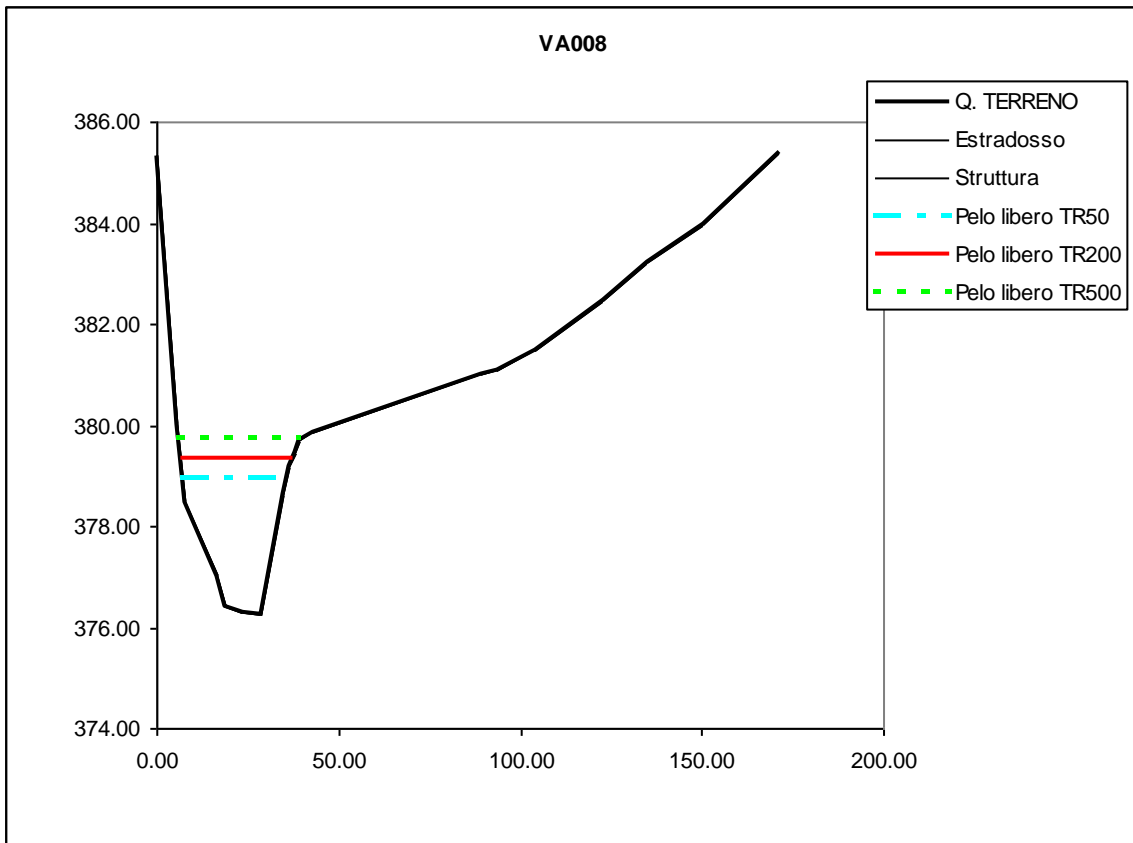
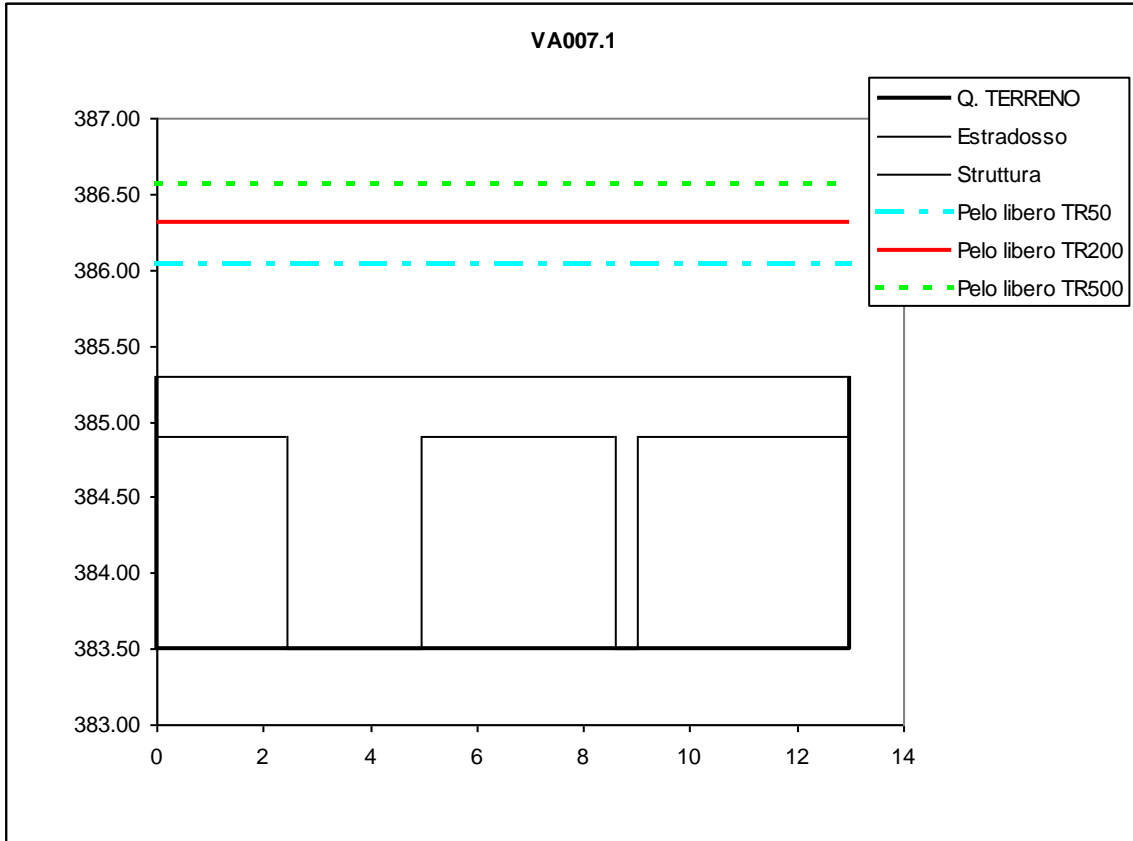


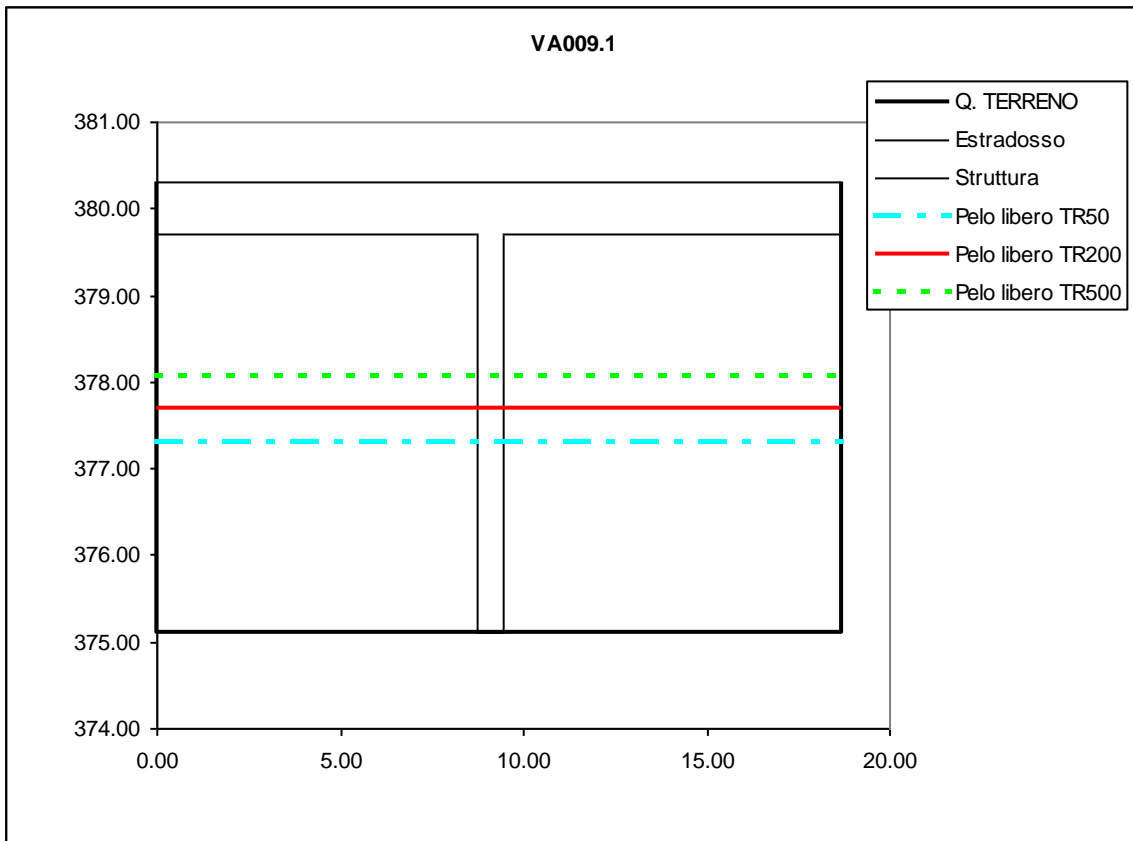
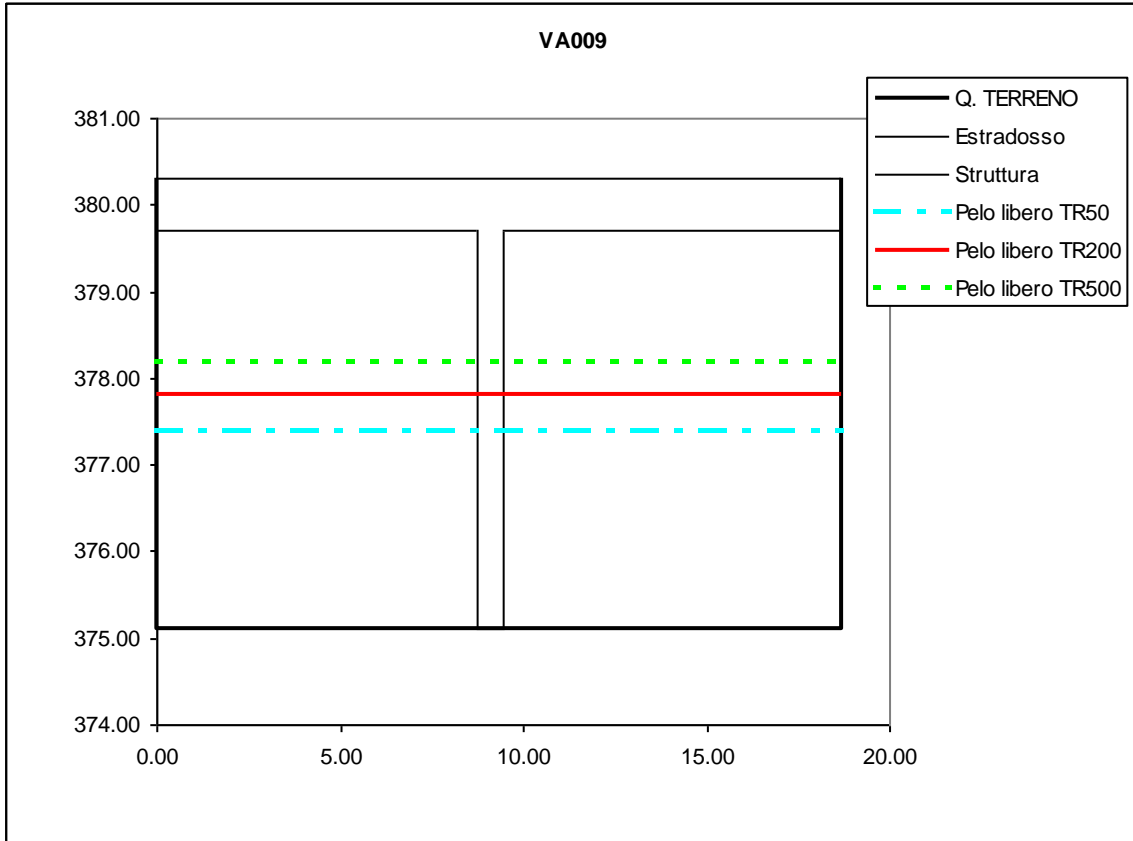


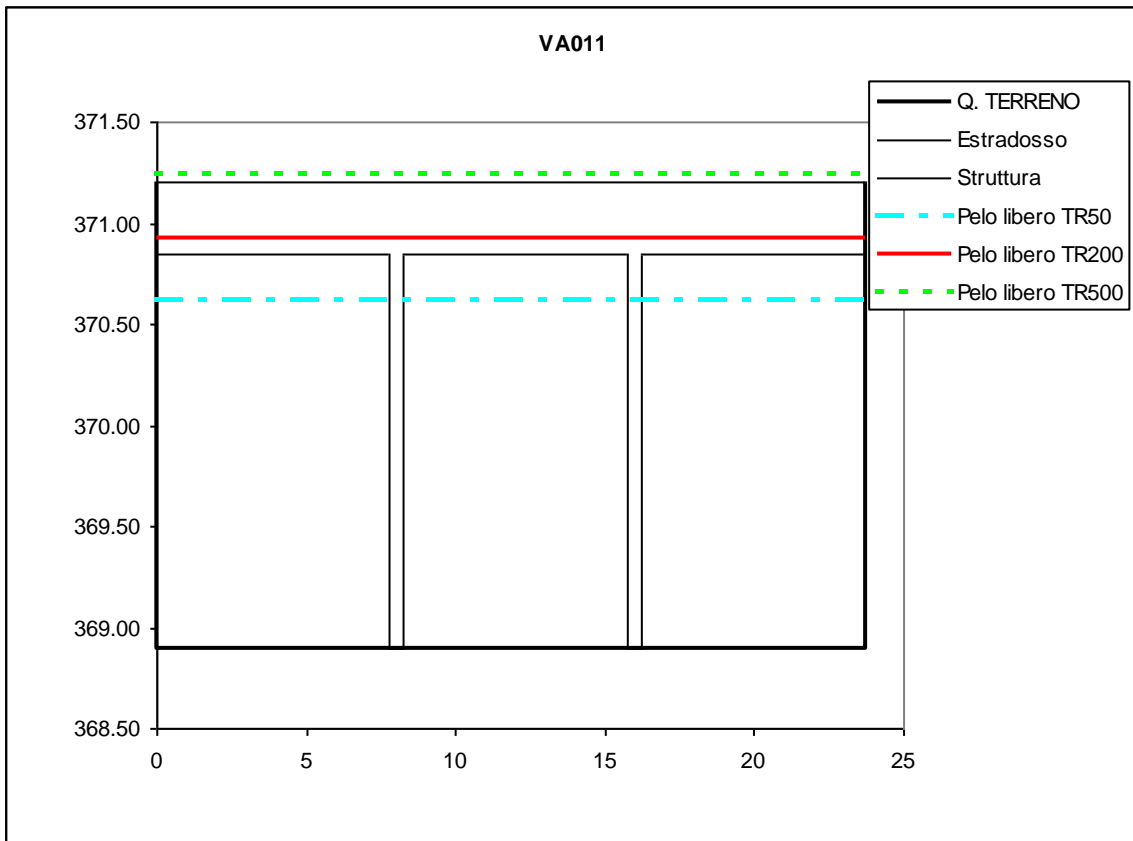
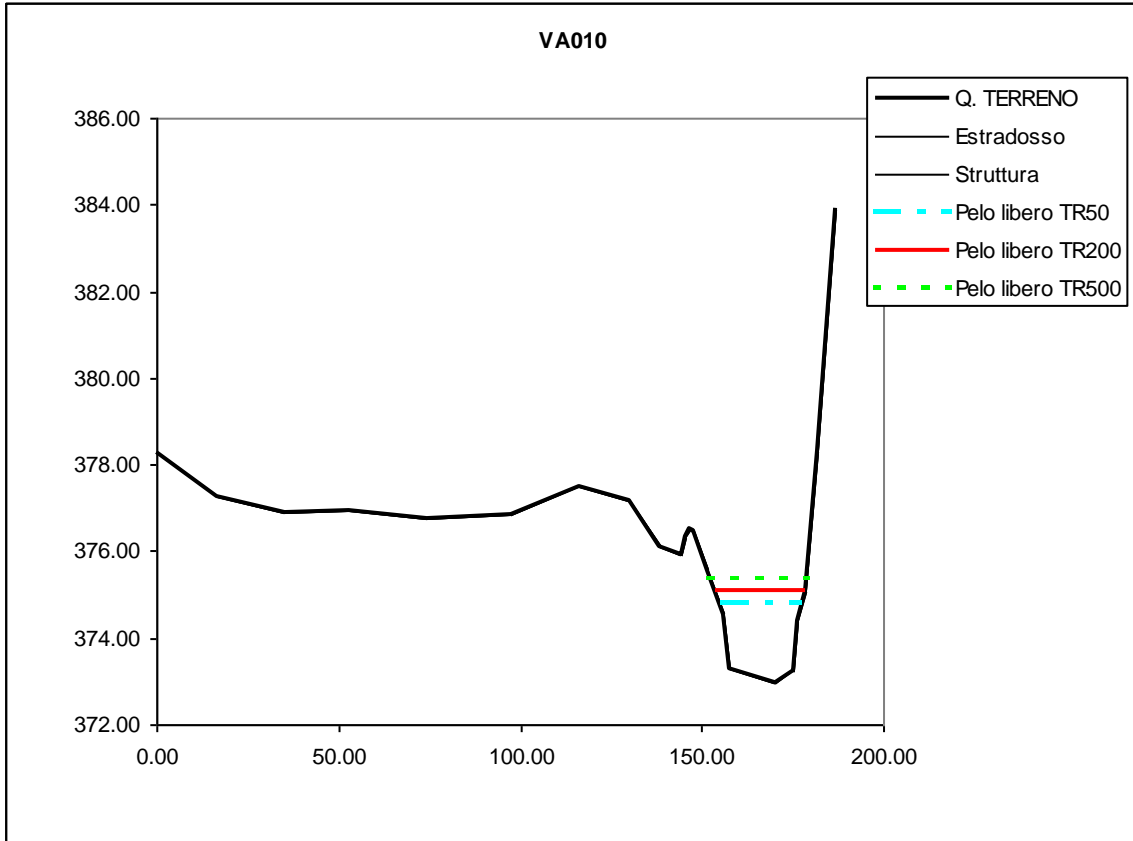


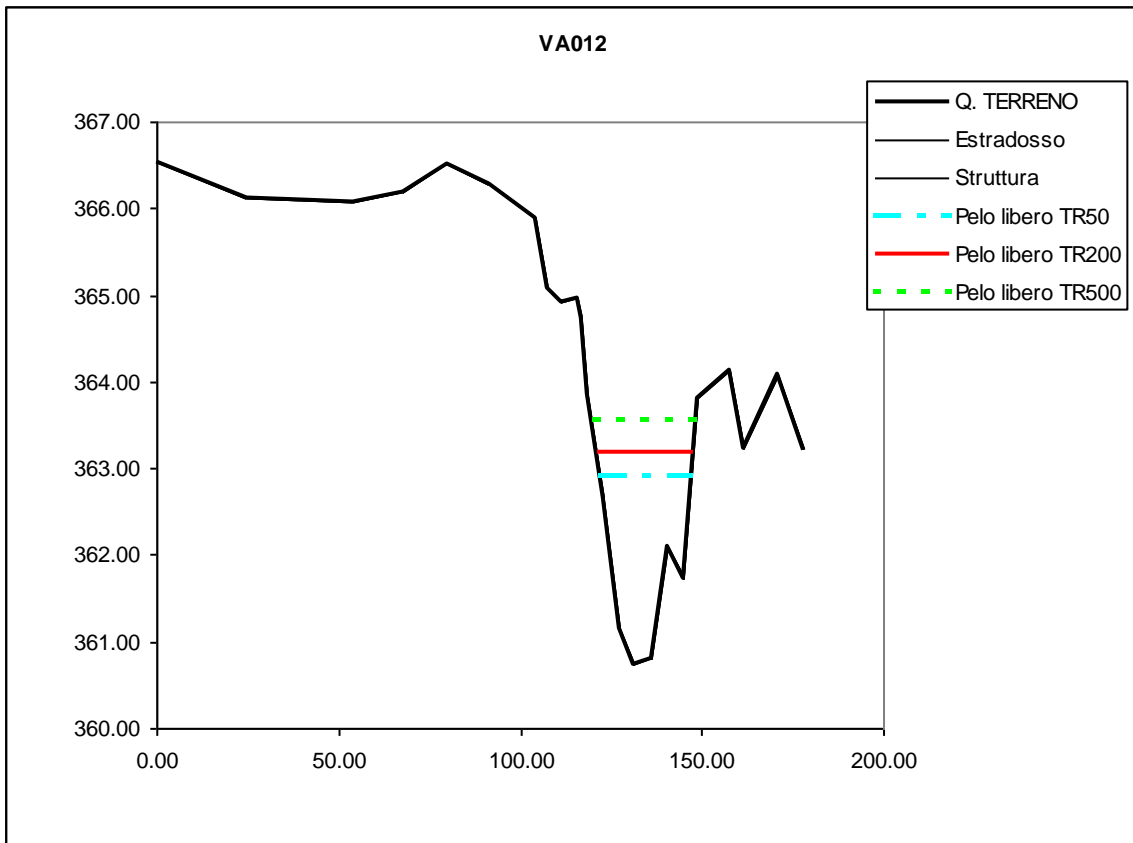
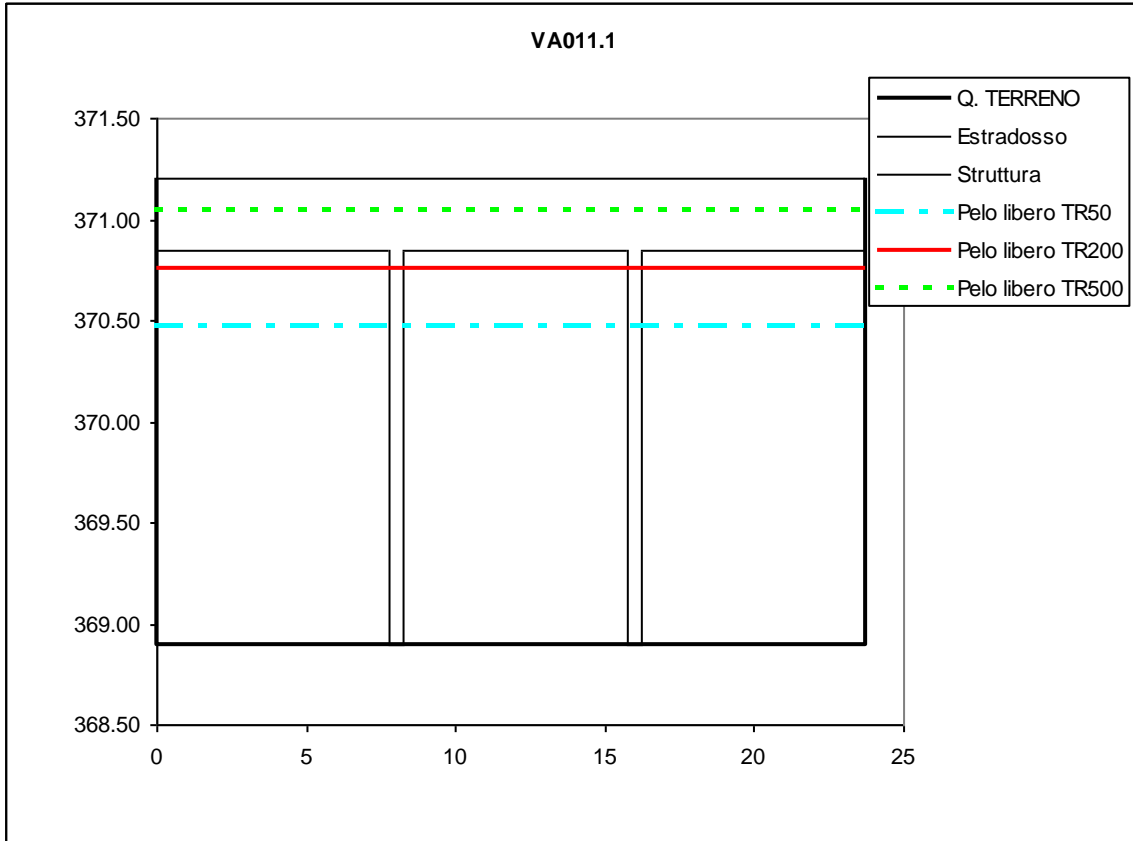


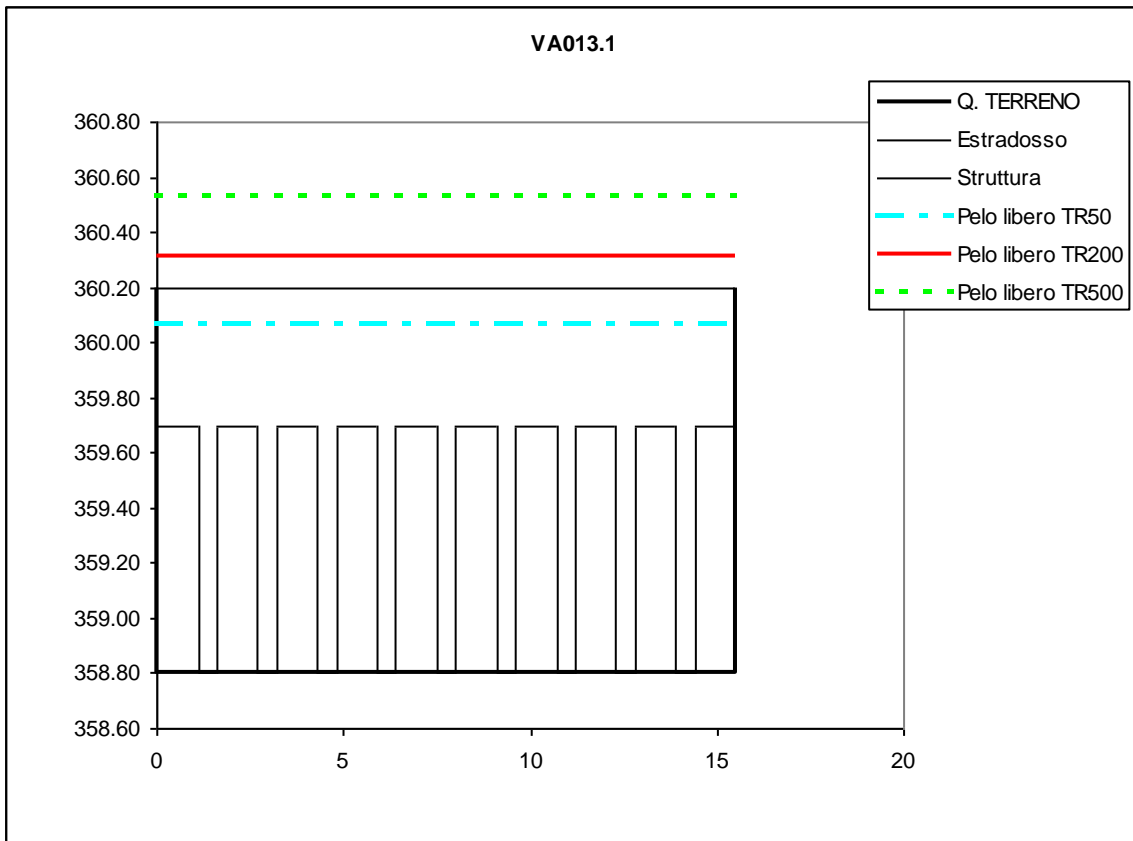
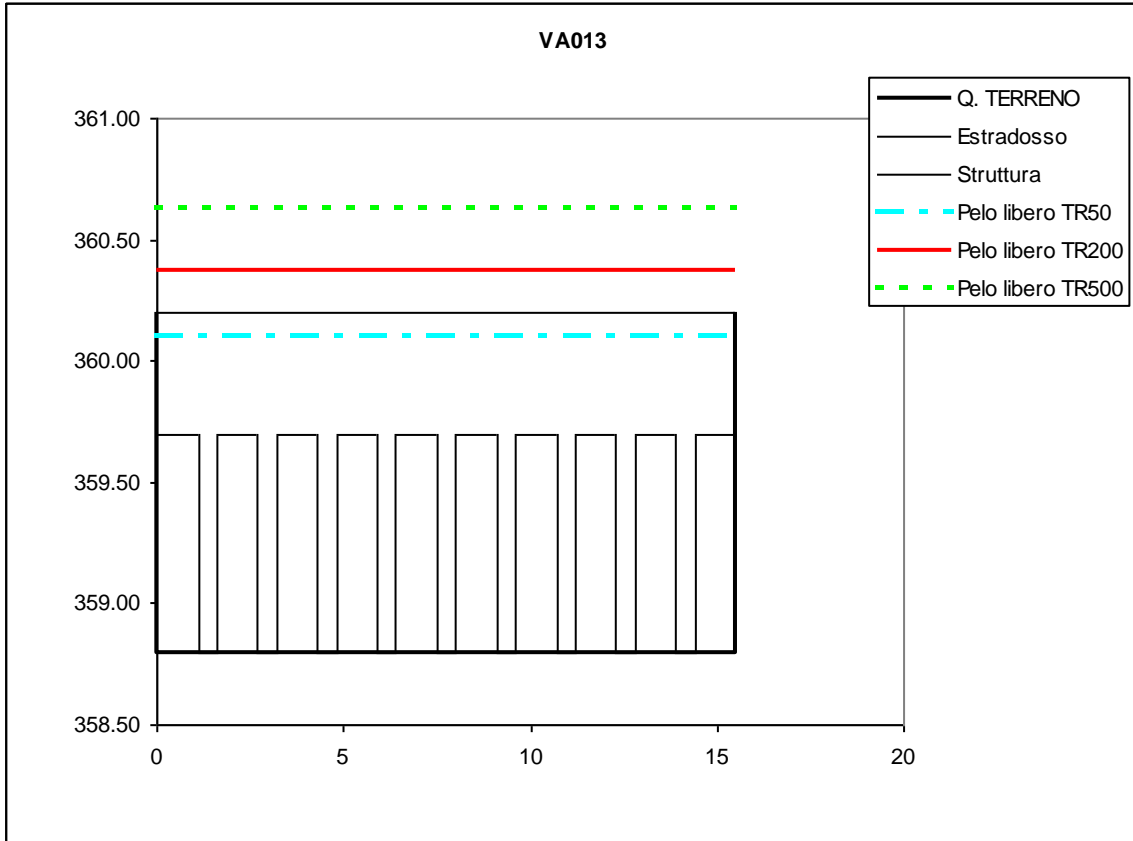


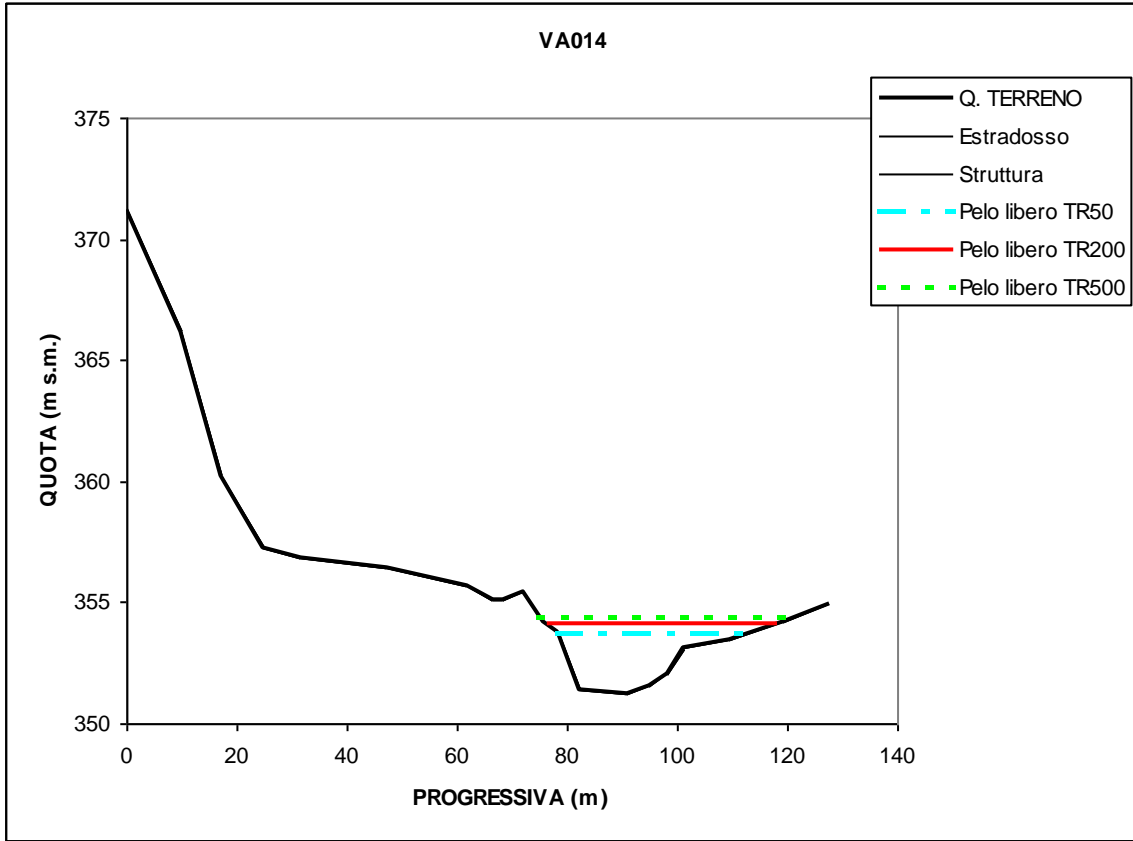






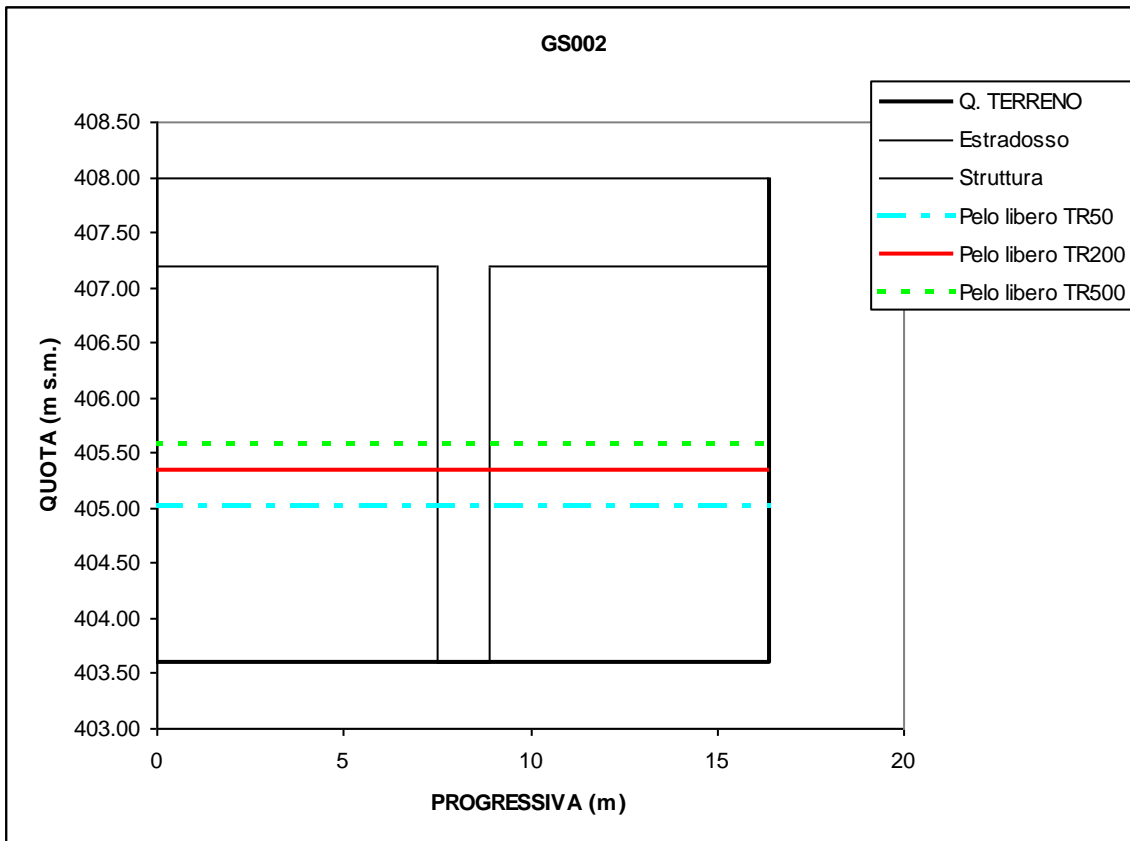
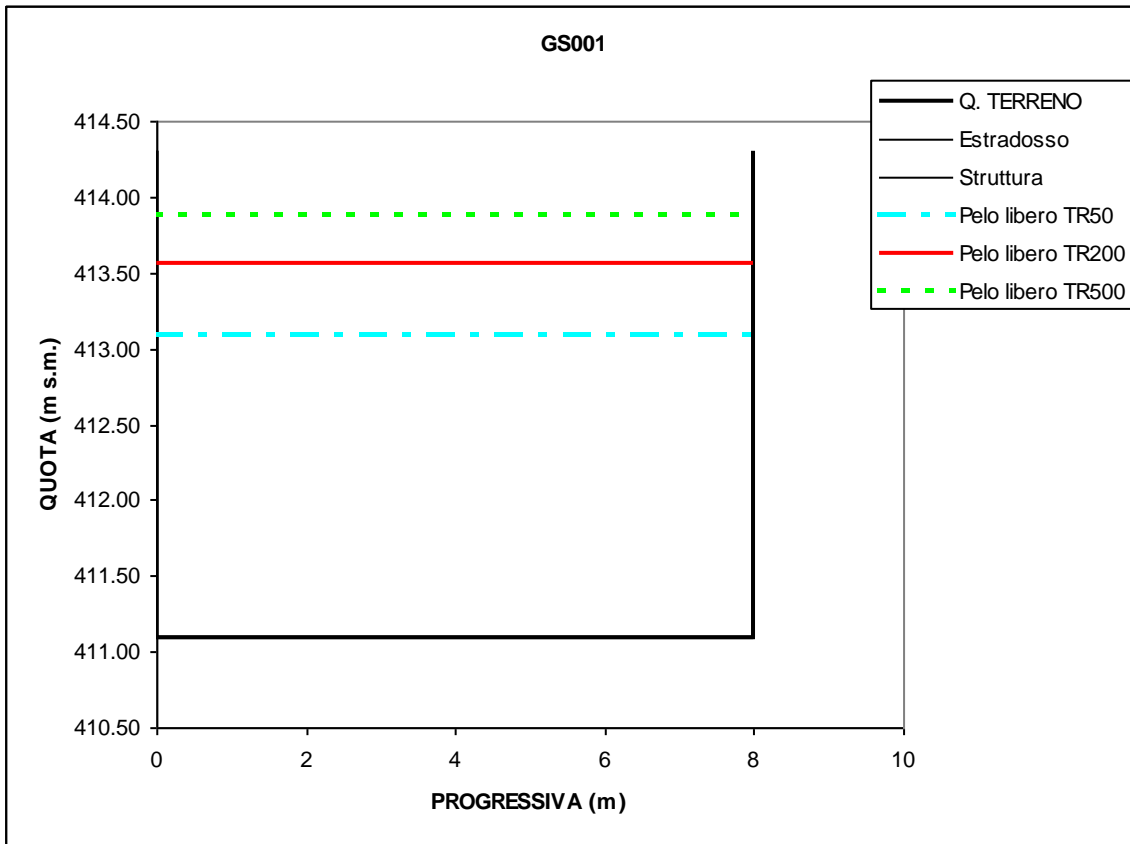


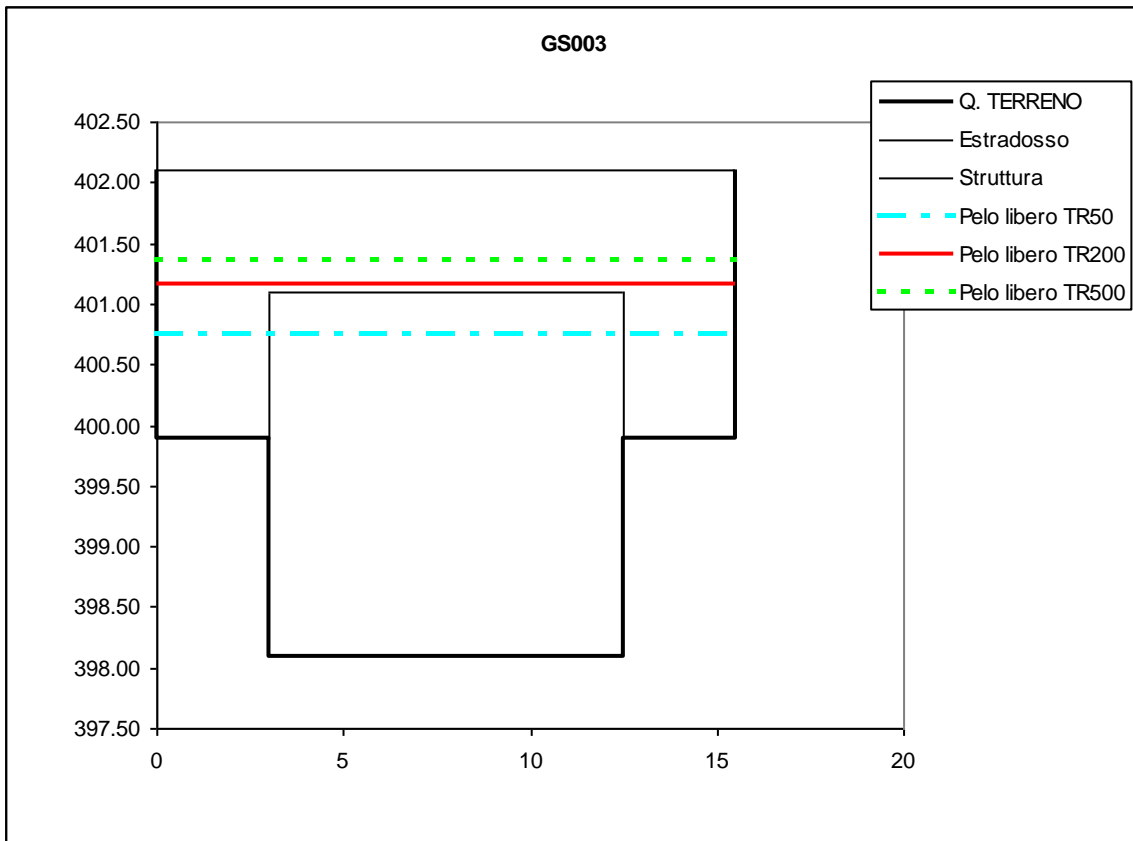
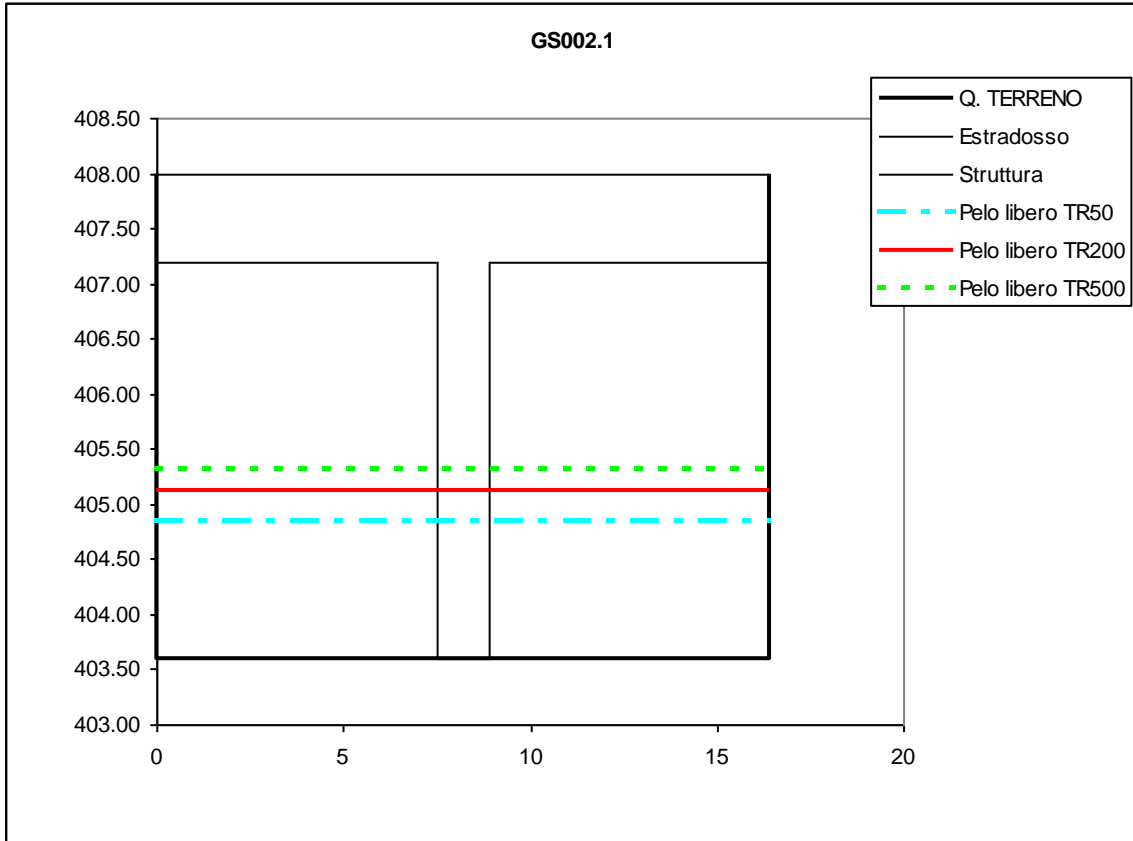






# **TORRENTE GIUSVALLETTA**





GS003.1

